VOICES OF REVOLUTION

Listening to Clandestine Radio

Watch What Happens!

The SR2000A is an ultra-fast spectrum display monitor that lets you *SEE* received signals in *FULL COLOR*

AOR SR2000A
Frequency Monitor

- **Frequency coverage: 25MHz ~ 3GHz (no gaps)***
- **Ultra-stable, high-sensitivity triple-conversion receiver**
- **External video output (composite video)**
- **AM/NFM/WFM/SFM/TV receive modes**
- **Displays up to 40MHz of spectrum bandwidth (20MHz or 40MHz selectable)****
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- **Waterfall (time) display function**
- **1000 memory settings (100ch x 10 memory banks)**
- **Average or peak value readings**
- **Video display function (NTSC/PAL/SECAM auto select)*****
- **5 inch TFT color LCD display**
- **Versatile color display uses state of the art digital signal processing**
- **High speed FFT search quickly captures new signal transmissions**
- **Easy menu-driven operation**
- **PC control through RS232C serial port or USB interface**

simulated video

Using the power of FFT (Fast Fourier Transform) algorithms with a powerful receiver covering 25MHz ~ 3GHz*, the SR2000A features a color monitor that displays up to 40MHz spectrum bandwidth or video display of NTSC, PAL or SECAM signals. Ultra-sensitive, incredibly fast, yet easy to use, with a high quality internal speaker for crisp, clean audio signals.

Scans 10MHz in as little as 0.2 seconds! Instantly detects, captures and displays transmitted signals.

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Tel: 310-787-8615   Fax: 310-787-8619
info@aorusa.com   http://www.aorusa.com

Authority on Radio Communications

*Government version. Cellular blocked for US consumer version.

**No audio is available when the frequency span is set to 20MHz or 40MHz.

***No audio available while displaying video signal on the LCD. If both video and audio need to be monitored simultaneously, an optional (external) TV2000 is required.

External or internal? The choice is yours!

The latest WR-G305e (USB) and WR-G305i (PCI) are the first commercially available VHF/UHF software-defined scanning receivers. Their all-mode digital demodulator works entirely in software, with easy upgradability and high performance level typical of receivers costing many times more.

Designed for demanding applications where it is important to locate even the weakest signals in background noise and extract the cleanest audio possible. Combined with excellent hardware parameters and extensive software support, the WR-G305 series defines a new standard for communications intercept and monitoring tools.

The new optional APCO P25 Decoder makes it possible to receive unencrypted digital APCO P25 channels on your WR-G305 series receiver. See the APCO P25 spectrum in real time, analyze transmission type, determine various embedded digital codes such as NAC, TGID, SID and DID, measure bit error rate, record transmissions and listen to crystal clear decoded speech!

So which one will you choose? The external WR-G305e offering perfect portability with your laptop, or the WR-G305i which hides neatly inside your desktop PC with no extra clutter on your desk? The performance is the same - the choice is yours!

- *9 kHz-1800 MHz frequency range* *(except cellular bands where required by law)*
- *Optional 3500 MHz downconverter*
- *Tracking front-end filters*
- *Dual-loop AGC and AFC*
- *Software-defined demodulation*
- *Excellent sensitivity*
- *Fast scanning speed*
- *Multiple squelch modes*
- *Real-time spectrum analyzer*
- *Sweeping spectrum analyzer*
- *Hit counter*
- *Accurate S-meter*
- *Adjustable IF bandwidth*
- *Adjustable digital audio filter*
- *Digital communications ready*
- *Digital Bridge™ compatible*
- *Standard PCI card or USB box*
- *Easy "Plug and Play" installation*
- *Optional professional demodulator*
- *Optional DRM decoder*
- *Optional APCO P25 decoder*

WR-G305e - portable and powerful!

WR-G305i - hides inside your PC!
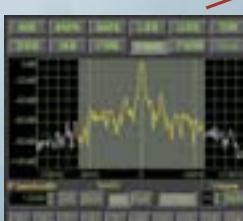
Professional Demodulator Option
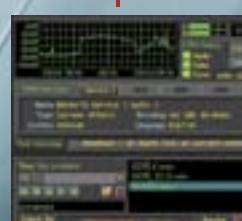
DRM Decoder Option

APCO P25 Decoder Option

Lead Story

Clandestine Radio

By Gayle Van Horn

"Voices for change" pretty much sums up the common character of clandestine radio stations. Whether the station is agitating for political reform from inside the country, or seeking to foment revolution from a secret location outside the reach of the current regime, clandestine stations are seeking to overturn some governmental status quo. Find a political hot spot and you'll no doubt find at least one "clannie."

Clandestine stations (except for those in your own back yard) can be very challenging to catch. Fortunately, there are hobbyists who specialize in the pursuit of such "subversive" stations. Turn to page 8 for clandestines, past and present, how to find them on the dial, and even how to sometimes QSL them.

On Our cover: Israeli Defense Forces female soldiers slouching toward Jaffa with guns and radio; photo courtesy Helena Cobban (http://justworldnews.org)

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Zimbabwe (formerly Rhodesia) won its independence from Britain in 1980. Since that time the country has had only one ruler – Robert Mugabe. Radio Voice of the People was inaugurated in 2000 to counter government shortwave broadcasts and to give a voice to opposition parties in the election. Although the effort to unseat Mugabe failed, the international community continues to support VOP as an alternative voice.

On a recent trip to Alaska, publisher Bob Grove went for simplicity by toting along a scanner with "Close Call" capability. His logs reflect what the scanner picked up in the largest US state which also has the nation's smallest population.

In today's difficult economic realities and increasing energy costs, broadcasters continue to search for ways to reduce transmitting power while retaining their target audience. To offset power reductions, Trans World Radio borrowed loop antenna technology from the time of Marconi to engineer an inexpensive way for listeners to boost reception at the receiver's end.

Reviews

MT takes its First Look at the GRE PSR-500 this month. Bottom line? "No one in the scanner marketplace right now offers a handheld scanner model that has the listening capability that is found in the PSR-500." (See page 66.)

KAITO's KA1121 is keeping up with the times by incorporating a removable MP3 player into its design. With long wave to shortwave coverage, weather channels, SSB reception, and rechargeable batteries, it is an impressive undertaking at a very modest price (see page 70).

Computers & Radio columnist John Catalano concludes that Dxtreme Software's RECEPTION LOG is an outstanding logging program, one of the best he's used (see page

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FeedBack

Happy Thanksgiving to one and all. This month the *Letters* column has a lot of comments on articles from the 2007 season. We'll take them in order of publication.

Mystery Radio

"I was re-reading the February 2007 *MT* (p67), and saw a letter and photos sent by J.Hollis from W.Va. The radio in the photos was made by Sony, but I don't have the exact model number. Those radios that were set-up like it, were called 'convertables.' They could be run on batteries, automotive electrical systems, and house current. Blaupunkt, Sharp, Nordmende, Becker, Phillips and others all made similar models. They were popular in Europe, which accounts for the presence of the LW band on many of them. In addition to power, they often had an external jack for connection to a vehicle antenna with the Motorola style plug.

"They were sold through catalogues like Radio Shack and Lafayette Radio. My 1975 Lafayette catalogue shows several models. AM, AM/FM, AM/FM/LW/SW. These convertables were popular with the 'dune buggy' set because they could be removed easily for security and when you arrived at your favorite beachside picnic spot, you had portable entertainment. One of mine has really hot reception on the AM broadcast band which I guess was to compensate for the poor vehicle antennas. Hope this info helps Mr. Hollis."

– Craig

"I owned one for years. This is the Sony 7F-74W AM/FM portable and car radio. Available around 1967. The radio plugged into a metal rack for vehicle mounting. It had mono-amp with 2.5W in vehicle. The car rack had a lock and operated from + or - ground and 6 or 12V. Last I knew it was still working!"

– E. Bixby

Fox Scanners

"Just a quick note to say that I also remember the Fox scanner. (See *Letters* June 2007.) As a new volunteer firefighter in the early 1980s, I needed a small scanner that would fit into my car. As it turned out, a fellow member of our F.D. had a side business selling electronics, and he carried the Fox scanner, among other things. I think I paid less than $100 for it. I was thrilled with its performance. One of its best features was its small size – it actually fit under the seat of my car!

"I sold the Fox long ago at a hamfest, but I still have fond memories of using it."

–Kevin Carey

Emergency Battery Ops

"Just wanted to comment on the great Emergency Scanner Operation article on page 13 (August issue). One concern was the use of a UPS to power scanners. Since most scanners run on low current from a wall-wart, the UPS most likely draws as much or more power than the radio, making the UPS a poor power source.

"Also, I recently read an article that some people tried to add an external car battery. The cheaper UPS usually runs for a very short time and as such does not have a cooling fan. This article warns of a potential overheating and a fire because of the long use time of this power source. Usually a UPS does not run long enough to get hot and therefore does not pose a fire hazard."

– Ron Gilson

WRNO Memories

"I'd like to take the opportunity to commend Dan Brown for his very insightful column concerning WRNO Worldwide in your August 2007issue.

"I began listening to the shortwave band in November 1982 after receiving my first shortwave radio as a present. WRNO quickly became a favorite target on the dial. I thank Mr. Brown for affording me the chance to take a very pleasant trip down memory lane!"

– David Baltes, Lackawanna, NY

Local Stations On Line

"Hi, Fred. I really enjoyed your column in the Sept *MT* about tuning into local stations from around the world such as the various BBC services and Australian services. You brought some things to my attention of which I wasn't aware. I miss the old 'News About Britain' which the BBC used to air at 9 minutes past the hour and now I can once again find out what's going on through a broadcast, not just by reading it. I have a penpal in England, so it is of special interest to me. I will definitely check out what there is to hear. You are probably also aware of **publicradiofan.com** which has a bunch of broadcasts to pick from, some NPR, some foreign. I was glad to see you were the one to take over this *MT* column."

– Sheryl Paszkiewicz, Manitowoc

Antique Electricity

"Read the article in the September *Monitoring Times* about building electric motors. The author mentioned that most of his favorite books were out of print. Well, the attached file is list of just a few of the books available from Lindsay's Technical Books, **www.lindsaybks.com/**.

"If you look at this site carefully, you'll notice a bit of humor and some warning about some of the books, e.g., Backyard Ballistics ... :) I tried to cull the list down to the electrical and electronic books that an *MT* reader might find interesting.

John Bishop

Lindsay's Technical Books
www.lindsaybks.com/

Title	No.	Price
1935 Shortwave Manual	22768	$18.95
Alternator Secrets	80	$3.00
Amateur Radio Beginners Guide	22423	$9.95
Armature Winding	4384	$19.95
Audel's Electric Motors	3114	$29.95
Build a Magneto Magnetizer	3008	$7.95
Crystal Receivers-Theory Design & Operat	3094	$11.95
Crystal Receiving Sets	22385	$10.95
Crystal Set Loopers	3093	$15.95
Dangerous Electricity	23411	$6.95
Doerle Shortwave Sets	820	$2.25
Dynamos and Electric Motors	22539	$9.95
Electrical Things Boys Like to Make	23241	$9.95
Electronic Dev & Circuits	5076	$15.95
Electrostatic Lightning Bolt Generators	20900	$8.95
First Vac Tube Regenerative Rcvr	22024	$9.95
Generators & Inverters	2085	$34.95
Gingery Coil Winding	386	$8.95
Harper's Electricity Book For Boys	22067	$19.95
Instr of Amplification	3112	$19.95
Mechanical Devices for Elec Exper	3057	$21.95
Mod Elec-Crystal Set	23276	$6.95
Morgan The Boy Electrician - Paper	21648	$19.95
Practical Electronics for Inventors	3105	$39.95
Radio Pioneers 1945	23462	$8.95
RCA Receiving Tube Manual RC-19	3054	$12.95
Safe & Simple Elec Experiments	3118	$7.95
Shortwave Quiz Book	4945	$4.95
Shortwave Radio Manual	4643	$15.95
Teach Yourself Electronics	3121	$13.95
Telephones & Microphones	23047	$7.95
Tesla Coil Handbook	3007	$14.95
Thomas Edison for Kids	5131	$14.95
Thordarson Transformer Manual	22431	$11.95
Those Great Old Handbook Receivers	21710	$8.95
Twinplex Regenerative Receiver	22148	$7.95
Underhill Solenoids,Electromagnets	20960	$15.95
Voice of Crystal	3099	$14.95
Vol 1 Impov Radio Experimenter	22407	$5.95
Vol 2 Impov Radio Experimenter	22571	$5.95
Vol 3 Impov Radio Experimenter	22733	$6.95
Vol 4 Impov Radio Experimenter	22920	$6.95
Vol 5 Impov Radio Experimenter	22938	$6.95
Vol 5 Xtal Set Society Newsletter	3042	$10.95
Vol 6 Impov Radio Experimenter	23500	$6.95
Wireless Telephony	23560	$6.95
Xtal Radio: History,Fundamentals	3055	$11.95
Xtal Set 12 & 13	3124	$15.95
Xtal Set Building	3080	$15.95

You can call in your order at 815/935-5353 mornings Central Time or write PO Box 538, Bradley, IL 60915 and request a catalog.

COMMUNICATIONS

Ignorance is Bliss

Does the public know their analog televisions will go dark on February 18, 2009, unless they are prepared? Some think the government is relying too much on the industry to spread the news.

In early 2006, Congress passed a budget bill that requires over-the-air television stations to switch completely over to digital broadcasting after February 17, 2009. After that date, anyone who watches TV via "rabbit ears" or a rooftop antenna (as opposed to cable or satellite), and whose TV does not have a built-in or separate digital tuner, will stop receiving programs on that TV.

Because the switch-off of analog TV broadcasts would deprive many viewers of their only source of television, Congress also created a subsidy program. Run by the government's National Telecommunications and Information Administration (NTIA), the program will provide $40 coupons (limit of two per household), each of which can be used to pay toward one digital converter box. The boxes, which are supposed to sell for $50-$70 each and be available from electronics retailers, can receive digital broadcasts to provide standard-definition programming to an existing analog-tuner TV.

These coupons should be available from early 2008 through March 31, 2009; they must be used within 90 days of their issuance and only on certain over-the-air digital signal converters. As 2008 approaches, you can find more information on this program at the National Telecommunications and Information Administration (NTIA) which is administering the coupon program (**www.ntia.doc.gov)** or at

the Commission's DTV website, (**www.dtv. gov).** Also check out **www.fcc.gov/cgb/consumerfacts/digitaltv.html**

The Federal Communications Commission also adopted rules September 11 to ensure all cable subscribers, including those with analog TV sets, can view broadcast television after the transition to digital television. Approximately 35 percent of all television homes, or approximately 40 million households, are analog-only cable subscribers. By statute, cable operators must make local broadcasters' primary video and program-related material viewable by *all* of their subscribers. The FCC's ruling allows cable operators to comply with the viewability requirement by choosing to either: (1) carry the digital signal in an analog format of equal quality, or (2) carry the signal only in digital format, provided that all subscribers have the necessary equipment to view the broadcast content. The viewability requirements extend to February 2012.

Rebanding

In its September 11 Memorandum Opinion and Order, the Commission determined that Sprint did not meet the interim 18-month rebanding benchmark established by prior orders, and established additional benchmarks to ensure that the rebanding process proceeds expeditiously. The Order also requires Sprint to complete clearing of all Channel 1-120 incumbents in non-border areas, other than Sprint and SouthernLINC, by December 26, 2007. Sprint must clear its Channel 1-120 facilities and those of SouthernLINC, within a specified time following a request by a public safety licensee to use those channels.

Automated Reporting Site

In response to recommendations submitted by the independent panel reviewing the impact of Hurricane Katrina on communications networks, the Public Safety and Homeland Security Bureau (PSHSB) of the Federal Communications Commission (FCC) launched a newly designed and automated Disaster Information Reporting System (DIRS). DIRS is a voluntary, efficient, web-based system that communications companies can use to report communications infrastructure status and situational awareness information during times of crisis.

Participating communications providers that serve areas affected by disasters will be able to voluntarily submit information regarding, the status of their communications equipment, restoration efforts, power (*i.e.*, whether they are using commercial power, generator or battery), and access to fuel. This information

will not be available to the public, however, and will be treated as sensitive, for national security and/or commercial reasons.

ECAD! Newfangled Interoperability

The APCO Project 25 standards were created to enable compatible two-way voice communications between platforms. Now the Department of Homeland Security (DHS) is conducting a computer-aided dispatch (CAD) case study in Silicon Valley, Calif. The CAD Interoperability Project (CADIP) aims to assist local and state emergency response agencies as they migrate to multijurisdictional, interoperable CAD systems. CADIP is expected to yield tools, templates, guidance documents, and other resources that will assist agencies in planning for and implementing similar CAD interoperability efforts.

Old-Fashioned Interoperability

In Oregon, a commercial trucker heard police radio traffic related to a high-speed police chase. Using CB, he and two other truckers coordinated a rolling roadblock by slowing to 5 mph. The frustrated driver stopped and fled on foot but was soon apprehended.

Controllers Protest Radio Ban

The National Air Traffic Controllers Association is protesting a ban by the Federal Aviation Administration on commercial radios, weather radios, and cell phones from air traffic control facilities. The FAA claims the radios are a dangerous distraction. NATCA cites incidents in which controllers were completely unaware of nearby tornados or severe weather information until informed by family or co-workers tuned to radio or television.

Weather Radios Recalled

Oregon Scientific has recalled around 66,000 Weather Radios for unreliable reception of severe National Weather Service alert signals. The recall includes the following Weather Radios and Weather Stations: All Hazards Portable Weather Alert Radio – WR103NX; Portable Public Alert Radio – WR108; Public Alert Weather Station – WRB308; John Deere Public Alert Weather Station – WRB308J.

Consumers should contact Oregon Scientific for instructions on returning the radio to receive a free replacement (call 800-203-4921

between 8 a.m. and 5 p.m. PT Monday through Friday or visit the firm's Web site at **www2. oregonscientific.com).**

Russian "Aggression"

Russia has been making its presence known lately, not only in military overflights (see this month's *Milcom* column), but also on air. The *Russia Today* television channel, now housed in a new modern studio, now has a branded channel on YouTube (**www.youtube. com/russiatoday**), has joined the Association for International Broadcasting, expanded coverage in Europe through agreements with satellite TV operators in Belgium and the Netherlands, and is now available in the US as well. RT and MHz Network – an independent, noncommercial US television network – has signed an agreement with *Russia Today*, making it available on their digital channel 5, analog channel 56, and on the Comcast cable network in the Washington metropolitan area.

Cuban Radio 85th Anniversary

Cuba was one of the first Latin American countries to develop a radio broadcasting network. The first radio station was inaugurated on August 22, 1922. Celebration of the occasion included the presentation of a cancellation stamp commemorating the anniversary. Radio Rebelde, the Cuban revolution's radio station, broadcast for the first time on February 24, 1958.

High Adventure Founder Dies

In 1979 High Adventure Ministries operated the first Christian radio station in the Middle East, called Voice of Hope. A millionaire at age 35, George K. Otis Sr. asked himself, "Is this all there is?" His refocused life brought the Christian message to many areas of the world which would not otherwise have heard it because of economics or political strife.

George Otis died July 22 at age 90.

Write Your Congressman

Small webcasters continue to battle for copyright and artist share payments they can survive with. The latest offer from SoundExchange was rejected by the majority of webcasters, for a number of reasons.

SaveNetRadio said in a recent statement, "In the continuing absence of a genuine offer that would allow internet radio to continue to be the vital medium for new music discovery, we implore our listeners and fans of Internet radio to continue to urge your legislative representatives to pass the Internet Radio Equality Act (HR 2060, S.1353)."

A Pirate by Any Other Name...

Many would-be DJs who used to risk the wrath of the FCC by transmitting their pirate station from basement or attic without a license have been playing it safer on the internet. Tens of thousands of radio shows now air on the Web, playing music for every musical niche. But guess what? Such "broadcasters" may still be pirates. Any DJ who plays copyrighted music needs a license, and the ruling by the copyright board gave a major boost to the royalties due musicians and record labels. As we said, write your Congressman... See **www. savenetradio.org** for more.

"Communications" is compiled by editor Rachel Baughn KE4OPD, from news stories submitted by our readers. Many thanks to this month's fine reporters: Anonymous, David Carberry, Mark Cobbledick, Chanel Cordell, John Figliozzi, Alokesh Gupta, Norman Hill, Sterling Marcher, Robert Nickels, Ken Reitz, Doug Robertson, Brian Rogers, Gregory Smith, Larry Van Horn, Sakthi Vel, Ed Yeary.

CLANDESTINE RADIO
Voices for Change

By Gayle Van Horn W4GVH

1st Battalion Royal Gurkha Rifles

Inside a canvas tent, a gas lantern dimly illuminates a man sitting at an old wooden table. Nearby, some of his comrades armed with AK-47's guard the rebel camp. Just as rain starts to fall on his tent, the man reaches for an old RCA ribbon microphone. This old military surplus tent serves as a makeshift broadcast studio. The transmitting equipment inside the tent is also old, crude, and inexpensive by current broadcasting standards.

And on this dark and damp night, the radio announcer will defiantly and covertly broadcast his revolutionary group's political message for all the world to hear (or so he hopes). He is broadcasting from a clandestine radio station.

The operator speaks of change and airs a form of psychological warfare to a neighboring country, threatening its people and leadership with war. The radio operator knows his signal will surely be jammed, but he uses his voice to reach a large geographical area. The defiant voice knows, too, that his broadcast will be tracked down using direction-finding techniques. It is clearly his goal and mission to destabilize the neighboring country, at any cost.

Clandestine broadcasters may be a single voice in the desert or they may disseminate their cause from a sophisticated commercial broadcast station. Either way uses propaganda to advance an opposing ideology or to reeducate a nation whose media is tightly controlled.

Dissecting the clandestine

Unlike the pirate radio operator who airs for the fun of broadcasting, the clandestine's goal is usually one of promoting conflict and change. There can be no single definition of "clandestine radio," as these broadcasts are a variety of shades from white to black, open and aboveboard to devious and underground.

In its truest sense, a clandestine broadcast is a political radio transmission from an organization, guerilla group, or radio station, which is considered illegal in its targeted country.

While certainly an adequate definition, this hardly covers the varied aspects and subcategories of clandestine radio stations. A "pure" clandestine is one where the studio is in a secluded area, within or near the borders of the target country, and is run by an established revolutionary group. Transmissions may also be through facilities owned and operated by a foreign country (which remains unnamed to prevent open conflict between governments.)

Stations may also be "independent stations," whose goal is not to inflict conflict or war, but to broadcast information to a local or bordering country or region in crisis. One example is this year's new independent station, Cotton Tree News in Sierra Leone.

A clandestine station may also be referred to as an "opposition station." These are not clandestines in the truest sense, but are instead stations with opposing viewpoints to the ruling government or ideology.

To further confuse the listener, the terms "quasi" or "white clandestine" are sometimes used. Radio Martí is often described by either reference. Radio Martí, funded by the US government, is based in Miami, Florida, and is targeted to Cuba. Programming is relayed via Greenville, North Carolina, with a mission of fighting communism.

A "white" clandestine is operated by a guerilla group or by a foreign government; its location is publicly known and it broadcasts on a regular schedule. Radio Free Asia, Radio Martí and Voice of Free Tibet are three examples.

Some clandestines are the creation of an opposing country, but the sponsoring organization may be a front for the true sponsor. Many of these "black" types are run by exiles gathered together to act as a front, or they may have been given assistance in the creation of programs to air over the opposing government's radio station. One example is station SW Africa. This station is opposed to

RADIO Martí

the Mugabe government, and it is run by exiled Zimbabweans in the United Kingdom.

Many *clanny* stations are deceptive and may spout outright lies or half-truths intended to inflame its listeners or the opposition. To protect themselves or to cause more disruption, they may claim an incorrect sponsoring government or organization and a false location.

As political situations change, a clandestine may leave the air abruptly, only to resume the mind games from a new location. Whether broadcasting during war or threatening to initiate an invasion, clandestine radio monitoring is a fascinating realm to monitor in the shortwave hobby.

Psychological Warfare

Clandestine broadcasting dates from the early days of radio. As early as 1927, Russia, Germany and Britain were using propaganda via radio to attain significant political and economic goals. Then as now, radio was used as a means of psychological warfare to essentially play mind games with one's enemy.

Psychological warfare via radio has been used in every conflict and war since World War II. It was used by the Allies and Axis nations toward each other, including Japan's *Tokyo Rose* and *Axis Sally* in the Pacific and European theaters. *Operation Annie*, run by the U.S. during the Battle of the Bulge, broadcast both as a strategic and tactical station. On American soil, one example was a series of clandestine stations operated by the KGB from Soviet consulates in San Francisco and New York.

The Vietnam War ushered in a new series of clandestine radio using psychological operations (PSYOPS) warfare. A seven-station radio network was established in South Vietnam. When the transmitters were not being used

Clandestine broadcasts from the past. Clandestine radio made from used parts by the French Resistance. Courtesy of www.museumofworldwarii.com.

to broadcast overt messages to the North, they were used to broadcast "black" clandestine stations that claimed to be from the Communists. Many Vietnam veterans recall the notorious *Hanoi Hanna* using a daily radio program of music and messages of discouragement to troops.

Other conflicts with high levels of clandestine radio activity included Falkland Islands, Grenada, Panama (Operation Just Cause), Haiti (Operation Uphold Democracy), Somalia (Operation Restore Hope), Bosnia and Kosovo (Operation Allied Force), and the Gulf War (Operations Desert Shield and Desert Storm).

The Gulf War brought an expansion of PSYOPS warfare through radio, television, loudspeakers and leaflets. The 4th PSYOP (4th Psychological Operations Group, Airborne) began broadcasting *The Voice of the Gulf* radio network on January 19, 1991, and operated continuously for four months. Iraq chose to use *Baghdad Betty* to conduct propaganda broadcasts to deter and disillusion the enemy. Perhaps the best testimony to the effectiveness of PSYOPS was an Iraqi General who commented, "Psyop was a great threat to troop morale, second only to coalition bombing campaign."

Today psychological warfare via clandestine radio continues to play a vital role in appealing to the listening audience in Afghanistan. Beginning in November 2001, a modified C-130 aircraft dubbed *Commando Solo* began blasting U.S. messages and local music on airwaves across Afghanistan. U.S. planes dropped tons of leaflets and distributed nearly 5,000 radios to civilians across the country. U.S. forces began PSYOP operations from Information Radio during the bombing raids to inform the Afghans as to why their country was being bombed. Operated by three soldiers from the U.S. Army Reserves, radio was being successfully used to entertain and inform residents of the Paktika province with themes that benefited both the Afghan civilians and coalition forces.

By October 2004 a new station for Afghanistan, Radio Solh (Radio Peace), a PSYOP radio station operated by the U.S. Army, was heard by DXers in Europe. Programming included regional music and urged listeners to report the whereabouts of Taliban leaders in Pashto, Dari and Urdu languages, and a regular station promotional stating "Radio Solh is the best reliable source. It broadcasts news, informative reports and lively music."

Radio VOP
Voice Of the People

Today, Radio Solh continues its broadcast and appeals for information leading to the arrest of Osama bin-Laden.

Radio Peace is currently broadcasting on 17700, 1200-1800*. Programming is in Dari and Pashto, relayed from transmitters in Rampisham, United Kingdom.

Radio Swan

The most widely heard clandestine station on shortwave in the 1960s was Radio Swan, which surfaced in May 17, 1960. Situated in the Gulf of Mexico on an island claimed by the United States and Honduras, Radio Swan broadcast on 1160 AM and shortwave 6000.

The station announced itself as a commercial station owned by the Gibraltar Steamship Company from Swan Island. Their Spanish programming promoted an obvious anti-Castro slant and was in truth operated by the CIA. Given its excellent proximity to the island of Cuba, not only did the station reach its target area, but the entire Caribbean as well. Soon after the broadcasts began, Castro began jamming its signal and initiated La Voz de INRA (The Voice of INRA), a precursor to Radio Havana Cuba.

By March 1961 the station had lost some of its effectiveness and its reputation began to suffer among listeners. Management revised programming to an all-news format while infusing its broadcast with coded messages, declaring the station was *"assisting those who are fighting Castro within Cuba."*

During the Bay of Pigs invasion April 15-19, 1961, it became obvious that Radio Swan broadcasts were being used to assist the landing forces. Radio Swan transmitted coded messages to the invading forces and guerillas inside Cuba, suspending normal programming to serve as a communications link.

Shortly after the aborted invasion, Radio Swan changed its name to Radio America. The station was heard throughout the middle and eastern U.S. states, even verifying reception reports until it closed services in May 1968.

The 1980s and beyond

Central America in the 1980s was a hot bed of clandestine activity, with a series of stations sponsored by the Sandinista government in Nicaragua and other opposing stations in neighboring countries. With the 1990 electoral defeat of the Sandinistas, the stations left the air.

Other notable anti-Castro clannies were:

Radio Impacto, supposedly a commercial station in San José, Costa Rica. Commercials were few and far between amidst an anti-Castro, anti-Sandinista slant and U.S. commentaries.

Radio Caiman (Spanish for *alligator*) began broadcasting in 1985 with a propensity of Nat King Cole music mixed with occasional anti-Castro references.

La Voz de Cuba Independiente y Democrática (CID) was relayed over legiti-

mately licensed broadcasters, including Radio Clarin in the Dominican Republic.

Asian clandestines were also active, despite threats and jamming by disputed governments. Following the Tiananmen Square revolt in Beijing, China, June 4, 1989, it was inevitable that a clandestine station would appear. Sponsored by Chinese students, The Voice of June Fourth broadcast over transmitter facilities in Taiwan, and was heavily jammed by Beijing.

From the Middle East, station activity was unprecedented during the Gulf War, as Iraq and its opponents aired programming to each other under an array of names.

This year's new stations

Several new stations began broadcasting in 2007. Cotton Tree News, an independent broadcaster relayed via Ascension Island, commenced February 19 from the studios of Radio Mount Aureol at Fourah College in Sierra Leone. CTN is sponsored by Swiss-based Foundation Hirondelle **www.hirondelle. org**, an organization that sets up and operates independent stations in crisis areas. Programming is transmitted daily, 24 hours on FM and satellite radio. Shortwave broadcasts are active on 9525 kHz, *0700-0800 UTC.* CTN is in partnership with Star Radio **www.starradio. org.lr** broadcasting from Monrovia, Liberia, relayed via Ascension Island. Star is heard on 9525, 0700-0730.

The Ethiopian rebel group radio, The Ethiopian People Patriotic Front (EPPF), was first heard in June. The station broadcast a weekly program *Ye Arbenyoch Dimts* (The Voice of Patriots) on 15260, *1600-1700.* Website **www.eppf.net/radio.htm** Ethiopian opposition website **www.eppf.info**

On July 2, religious broadcaster, Zena Tewahedo the Ligament Holy Synod of the Ethiopian Orthodox Tewahedo Church in Exile, began broadcasting in the Amharic language. Programming is relayed from a Samara, Russia, transmitter site. Monitors have observed the station on 15260, 1600-1700. Website: **www. eotcholysynod.org/**

Radio Furusato no Kaze (Winds of Hometown) began transmissions July 9. Relayed via Taiwan and targeted to North Korea, broadcasts are from the Headquarters of North Korean Abductions Issue, produced by Japan Center for Intercultural Communications, a government related organization at **http://jcic.or.jp**. Their current schedule reflects a Japanese program on 9870, 1600-1630.

Clandestine domination

Africa and the Middle East continue their stronghold on the clandestine broadcasting scene. Both have expanded their respective voices and represent a large number of stations monitored around the globe.

Andenet LeDemocracy Radio, relayed via Samara, Russia, targets its programming to Ethiopia. The station is a branch of KINIJIT Support Group in the United States, dedicated to bringing peace, unity, and prosperity to the people of Ethiopia through the democratic process. Amharic has been observed on 15260, 1600-1700. Website **www.andenet.com/** (or) **www.kinijit.org/** . Email *info@transmitter. org*

The National Radio of the Saharan Arab Democratic Republic has stated they are broadcasting from Bir Lehluin in a Polisario controlled region of Western Sahara, southwest of Tindouf, Algeria. Originally medium wave

only, the station reactivated in August 2006 adding a 20 kW shortwave transmitter. Broadcasts are intended to inform and communicate with the people in the occupied zone of western Sahara, about the liberation struggle situation against the Moroccan army. It remains the only radio station currently broadcasting directly from Algeria, and is supported by the Algerian government. Schedules on 6300 are: 0600-0800 (Arabic) 1700-1800 (Spanish) 1800-2300 (Arabic). Website with streaming audio **http://web.jet.es/rasd/radionacional. htm**

SW Radio Africa, mentioned earlier, is being logged via their Meyerton, South Africa, relay site on 4880, 1855-1859.*; and 12035 via Kvitsoy, Norway *1700-1735. Streaming and on-demand audio may be located at **www.swradioafrica. com**

Radio Fana (Radio Torch) was inaugurated November 7, 1994, and is operated by the Ethiopian People's. Revolutionary Front (EPRDF). Services include Afan, Amharic, Omoro and Somali. Their stated objective is to enhance economic development, good governance and tolerance in a multi-cultural federal system. Activity has been noted on 6110, 7210, 0330-2000. Website **www.radiofana.com**.

Radio Voice of the People, a Zimbabwean opposition station, is being heard on 9765 signing on at *0354. Programming is in Shona and Ndebele local languages. Relayed via the Radio Netherlands, Talata-Volondry relay site, the station is financed by the Soros Foundation, the USIA Zimbabwe Forum and the Dutch Foundation HIVOS. Radio VOP, began broadcasting in June 2000, ten days before the Zimbabwean parliamentary elections were held on the 24th and 25th of June. The station continues to promote peace in the ongoing troubled political times with hopes of building a democratic society. VOP has been

reported as being jammed by the Zimbabwe government. Website **www.vopradio.co.zw/** Electronic reception reports may be sent to *voxpozim@yahoo.com.uk*

Kurdish station, Dengê Mezopotamya (Voice of Mesopotamia), was first observed in May 2001. It is relayed via Grigoriopol, Maiac (Moldova/Pridnestrovye) and identifies itself as "Denge Mesopotamia," and in English as the "Voice of Mesopotamia." Currently active on 11530, daily 0400-2000 in Kurdish to western Asia. Website **www.denge-mezopotamya. com/DM/**

Radio Voice of Oromo Liberation (Sagalee Bilisummaa Oromo-SBO) is sometimes referred to as "SBO" after its title in the Oromo language, "Sagalee Bilisumma Oromoo." SBO supports the Oromo Liberation Front and other groups opposed to the Ethiopian government. They were previously heard from 1988 -1992 from a site in Sudan, and they have broadcast from Germany since 1993. SBO broadcasts in the Oromo language on 13830 from 1700-1800. Website with on-demand audio **www.oromoliberationfront.org.** Email *olfinodesk@earthlink.net* (or) *sb013366@aol. com*

Radio Freedom – Voice of the Ogadeni People (Radio Xoriyo Ogadenia) – relays programming via Samara, Russia. They were first heard in 2000. They remain supportive of the Ogadenia National Liberation Front and are hostile to the Ethiopian government which it describes as the "Tigray regime" (a reference to the supposed domination of the government by ethnic Tigrayans). Audible on 15260, *1600-1630.* Website **www.radioxoriyo. com**

Southern Sudan Interactive Radio (SSIRI) is relayed from Kigali, Rwanda and Dhabbaya, United Arab Emirates. Programming is designed to provide learning opportunities to the people of southern Sudan. The program supports the USAID Sudan Basic Education Program (SBEP), which has been operating since 2002. Funded by the U.S. Agency for International Development, in partnership with the Regional Economic Services Office for East and Southern Africa. Schedule: 11945, 0630-0700 (English to Sudan) and parallel on 15445 via Dhabbaya on Monday, Wednesday and Friday; 15260, 1600-1630 Tuesday and Saturday. Website **www.sudanradio.org/in-dex.php**

Voice of the Broad Masses of Eritrea is relayed via Asmara, Eritrea, on 7090, and has been noted at 0355 and 1535. Prior to the defeat of the Mengistu government in 1991, this station operated on a clandestine basis in support of the Eritrean People's Liberation Front (EPLF) and other opposition groups. The station is now government controlled and is the official radio of Eritrea, based in Asmara. However, the station still carries programming

supporting the Ogaden National Liberation Front and the Voice of the Somali People.

Voice of Democratic Path of Ethiopian Unity (Finote Democracy Voice of Ethiopian Unity) can be heard from Wertachtal, Germany on 9480, *1900-1959.* Finote Democracy is a group of overseas Ethiopians located in the Netherlands, Germany, and United States, promoting a democratic Ethiopia with a government respectful of human rights. Website with on-demand audio **www.finote.org**

Voices from Asia

Open Radio for North Korea broadcasts to promote the interest of human rights in North Korea. Programming includes Free Korean Central Broadcasting Station, produced by Union for Korean Democratization organization. Reported in English, relayed on KWHR Naalehu, Hawaii, 11565, 0730-0800 (Saturday) targeted to Pacific regions; 9930, 1100-1300 (Saturday) targeted to Asia. Future plans include weekend broadcasting.

Radio Shiokaze/Sea Breeze began broadcasting October 2005, with programming for the investigation Commission on Missing Japanese as related to North Korea. Relays are from Taiwan and Angarsk, Russia, logged on 9485 and signing on at 1300 with a piano interval signal into English programming. Website: **www.chosa.kai.jp** Reception reports may be posted at *chosakai@circus.ocn.ne.jp*

Democratic Voice of Burma is a nonprofit Burmese media organization committed to responsible journalism. Programs are produced by professional and independent radio journalists to provide educational services and information for the democracy movements inside and outside Burma, which opposes the current Myanmar government. DVOB uses the Wercthal, Germany, relay site, heard on 9490 from 2330-0030. Website: **www.dvb.no**

South Korean based Echo of Hope is affiliated with the Korean Living Abroad (Agency for National Security) and is reportedly run by South Korea's National Intelligence Service. EOH has been monitored on 3985, 6003 and 6348, 1220-1240.

This year's extra voices

Poland based Radio Racja, is relayed via Warsaw and Sitkunai, Lithuania. Initially they launched in 1999 and were suspended in 2002 due to lack of funding. Racja is currently broadcasting to audiences in Belarus and Poland, as well as the Polish minority on the eastern side of the border on 6225 (Sitkunai), 1530-1730; 6105 (Warsaw) 1930-2130; 6120 (Warsaw) 2200-2230.

Additional clandestine stations monitored this year include; Suab Xaa Moo Zoo, a US based religious broadcaster, relayed via Taiwan. Hmong service on 11655, 2330-0000. Website **www.hmongdistrict.org**

Radio Free Chosen via Taiwan on 9785 signs on at 2100 in Korean.

Hmong Lao Radio via WHRI, English on 11785 at 1300.

Sudan Radio Service 9840, 1500-1700 Arabic, Monday-Friday; 13720, 0400-0600 Arabic, Monday-Friday.

Korean based Echo of Hope 6003, 0300-0500; 1100-1150.

Voice of Democratic Eritrea opposes the government of Eritrea, and broadcasts in support of the opposition Eritrea Liberation Front Revolutionary Council on 15315, 1700-1800.

Radio Mustaqbal in Somali on 15455, 0600-0630, 0710-0740 Monday-Wednesday and Saturday via Dhabbaya.

Voice of Meselna Delina via Armavir, Russia, 11765, 1700-1730.

USA sponsored clandestines

As noted earlier, U.S. sponsored clandestine stations are considered *quasi-clandestine* or an *opposition* station. Three *opposition* stations are Radio Free Asia, Radio Free Europe/Radio Liberty and Radio Martí.

Radio Free Asia originally broadcast propaganda for the U.S. government in local languages to mostly communist countries. It is funded as a private nonprofit U.S. corporation by a grant from the US Congress to the Broadcasting Board of Governors. Their stated mission is to, "promote and sustain freedom and democracy by broadcasting accurate and objective news and information about the United States and the world to overseas audi-

ences." RFA broadcasts information and news to Asian listeners who lack regular access to fair and balanced news reporting from their domestic media. Electronic reception reports may be sent to *QSL@rfa.org* or *contact@rfa.org* Radio Free Asia has an extended multilingual schedule via various worldwide transmitter locations which should be consulted at **www. rfa.org/english/**

Radio Free Europe was founded in 1950 by the National Committee for a Free Europe. The organization exists today in the Middle East to "promote values and institutions by disseminating factual information and ideas."

Programming is on shortwave from many worldwide transmitter locations, as well as medium wave, FM and the Internet. In 1976, RFE was merged with another Congress funded anti-communist organization called Radio Liberty, and the two officially changed their name to Radio Free Europe/Radio Liberty. To learn more, visit their website at **www.rferl. org** or email contact *web@rferl.org* Radio Free Afghanistan is the Afghan service of RFE/RL. Relayed from Kuwait, Sri Lanka, and Morocco in Dari and Pashto languages, RFA promotes and sustains democratic values and institutions in Afghanistan by presenting ideas, information and current news.

Radio Martí was established in 1980 during the Reagan Administration. Based in Miami, Florida, Radio Martí relays over shortwave transmitters in Greenville, North Carolina, and a medium wave transmitter in Florida. The station's mission is "to provide a contrast to Cuban media and provide its listeners with an uncensored view of current events." Their website contains streaming and on-demand audio at **www.martinoticias. com/radio.asp**

Following the subversives

There are a few sources listeners may use to follow worldwide clandestine activity. Nick Grace's site, Clandestine Radio.Com **www. clandestineradio.com** contains archived material on CRW Exclusive intelligence reports and *Latest Global Crisis Watch* podcast. Additional links are *Country Intel* which lists stations by continent and country. Although not always current, it is a good site to download podcasts and gather archived material on stations.

Martin Schöch runs the Clandestine Radio Watch at **www.schoechi.de/crw.html** The site is updated bi-monthly about recent clandestine radio and related activities.

DX Window, the e-newsletter of the Danish Shortwave Club International, includes clandestine logs and information from contributors. The club's annual *Domestic Broadcast Survey* has a Clandestine List of by-frequency stations and schedule information. Consult **www.dswci. org/** for club membership and publications.

Danish DXer Finn Krone maintains a website that includes *Links to Clandestine Radio Stations* at **www.krone-web.dk/**.

QSLing clandestine stations

Some clandestine stations, either political or military, will provide printed matter related to their cause upon request (although not necessarily in English). Most welcome reception reports from abroad and publicize contact addresses. When corresponding with the station, it's important to remember what the group's mission and ideology is, and who their enemies are. Do not step into the station's cause to condemn it or politicize.

Most subversive organizations maintain a website where you can find out their ideology. Hopefully, the site will include an English link,

or check at **www.google.com** for a "translate this page" link. Web sites many also contain a contact address or telephone number. Correspondence addresses are normally not in the same country as the broadcast.

Correspondence should be handled cautiously. Depending on how secretive the station is, you may or may not receive a reply. Always include a self-addressed envelope and a prepared QSL card, as the station may not have either. Enclosing IRCs and currency have been used with success, but should be left at the discretion of the hobbyist.

An extensive listing of clandestine stations monitored from 2006 to present may be found in the author's *World QSL Book* from Teak Publishing, P.O. Box 297, Brasstown, NC 28902 or via email *teakpub@brmemc.net* for ordering instructions. Relay and station information are indicated, as well as verification policies, addresses, web sites and email addresses

A voice of change?

And now the radio announcer in the tent has finished his broadcast. The rain has stopped as the transmitter powers down. The announcer's comrades in camp celebrate this great victory with celebratory gunfire from their AK-47s. Have his words been heard by anyone else? Has he had an impact or changed any minds?

There is no way to know for sure. But that won't change anything: He would still make these clandestine broadcasts. Political boundaries may try to hinder his radio signals, but the clandestine operator will continue at any cost, hoping his voice will reach its intended audience. Such is the world of mystery and intrigue that is clandestine broadcasting.

*(Though not a complete listing of all clandestine stations, this focus has been on selected stations that have been monitored in 2007. Frequencies (kHz), broadcast hours (UTC) *sign-on - sign-off *, and web sites represent those current at the author's writing.)*

Radio Voice of the People
Zimbabwe's Alternative Voice

By Richard A. D'Angelo

Radio VOP staff accepts the One World Media Award in 2006.

Clandestine Broadcasting in Africa

Clandestine broadcasting provides some of the most interesting targets on the shortwave bands for listeners to tune in. The African continent has long been known for political instability, providing the right environment for clandestine broadcasting activities. Although many of these stations aren't in English, some are, and therefore provide an interesting insight into a political struggle in another land far away.

Radio Voice of the People is one such shortwave broadcaster providing a window into the troubled country of Zimbabwe in the region of southern Africa. In Zimbabwe, Radio Voice of the People has been providing an alternative to the state-controlled electronic media. This clandestine shortwave radio broadcaster offers a great DX target and an opportunity to eavesdrop on English transmissions from Zimbabwe.

Zimbabwe

The country of Zimbabwe is located in Southern Africa, between South Africa and Zambia with a population of about thirteen million. The capital city is Harare. The climate is tropical and is moderated by the altitude with a rainy season from November to March. The terrain is mostly high plateau with a higher central plateau and mountains in the east.

The government of Zimbabwe faces a wide variety of difficult economic problems as it struggles with an unsustainable fiscal deficit, an overvalued exchange rate, soaring inflation, and bare shelves. Involvement in a war in the Democratic Republic of the Congo from 1998 through 2002 drained hundreds of millions of dollars from the economy.

Badly needed support from the International Monetary Fund has been suspended because of the country's failure to meet budgetary goals.

Inflation rose from an annual rate of 32% in 1998 to 133% at the end of 2004 and 246.7% in 2005, while the exchange rate fell from 24 Zimbabwean dollars per US dollar to 15,200 in the same time period. The government's land reform program, characterized by chaos and violence, has badly damaged the commercial farming sector, the traditional source of exports and foreign exchange and the provider of 400,000 jobs.

England annexed Southern Rhodesia from the South Africa Company in 1923. A 1961 constitution was formulated that favored whites in power. In 1965 the government unilaterally declared its independence, but England did not recognize the act and demanded more complete voting rights for the black African majority in the country, then called Rhodesia. United Nations sanctions and a guerrilla uprising finally led to free elections in 1979 and independence as Zimbabwe in 1980.

Robert Mugabe, the nation's first prime minister, has been the country's only ruler (as president since 1987) and has dominated the country's political system since independence. His chaotic land redistribution campaign, begun in 2000, caused an exodus of white farmers, crippled the economy, and ushered in widespread shortages of basic commodities. Ignoring international condemnation, Mugabe rigged the 2002 presidential election to ensure his re-election. Opposition and labor groups launched general strikes in 2003 to pressure Mugabe to retire early, but security forces continued their brutal repression of regime opponents.

An unresolved issue is the ownership and use of land. After two decades of rule, former guerilla leader Mugabe has lost just about all international credit. Zimbabwe has in the past few years experienced a mass exodus of its population because of its political and economic problems. Estimates put the number of Zimbabweans who have sought a better life elsewhere at over three million people, or more than 20 percent of the population. It's with this political and economic backdrop that the clandestine shortwave radio station, Radio Voice of the People, operates.

VOP Background and History

Radio Voice of the People ("Radio VOP") is a registered communications trust whose programs are broadcast every evening on shortwave. With the Zimbabwe Broadcasting Service commencing shortwave broadcasting with new shortwave transmitters that were inaugurated in December 1994, transmissions of government-controlled national programs were broadcast on shortwave to rural areas. These transmitters are heard on 3,396 kHz and 6,065 kHz. This helped open the door to the possibility of opposition supported shortwave broadcasts reaching the rural populations of Zimbabwe with anti-government programming.

There are no existing independent broadcasters operating from within Zimbabwe, owing to tight government control of the media. Before the July 2000 elections in Zimbabwe, the Mugabe Government did not follow court orders to end its grip on the Zimbabwe Broadcasting Corporation and allow for dissenting voices to be heard on the station's channels. The ruling African National Union Patriotic Front ("ZANU-PF") even called for the banning of songs deemed derogatory to the party.

Radio VOP was established in the year 2000 as an alternative voice for Zimbabweans prior to that year's Parliamentary elections. A board of trustees leads Radio VOP on policy matters, while day to day operations are overseen by a full time executive director who is in charge of broadcast journalists and other support staff. The station receives funding from the Dutch group, Hivos, the Soros Foundation's Open Society Initiative, and the Heinrich Böll Foundation.

On 14 June 2000, Radio Voice of the People, which was staffed by former ZBC employees, started broadcasting in the Shona and Ndebele languages to Zimbabwe prior to

Mugabe (left) in early days with vice-president Joshua Nkomo

the elections and has continued broadcasting ever since. The Zimbabwe government is clearly worried by the continuing presence of Radio Voice of the People. In subsequent years, the Mugabe government has repeatedly launched complaints with other governments to silence the Netherlands backed Radio Voice of the People, as well as the Voice of America's *Studio 7* and another clandestine station based in London, Shortwave Radio Africa.

In the aftermath of Robert Mugabe's controversial victory in the country's general election, Radio Voice of the People launched a new web site and promised to continue operating. Since then, Radio VOP employees have faced harassment and intimidation from Zimbabwean authorities.

On 4 July 2002, police searched the Radio VOP offices for a transmitter, broadcasting equipment, and other evidence that the station was violating the Zimbabwe Broadcasting Services Act of 2001. The Act restricts stations from broadcasting without a license. The police did not find a shortwave radio transmitter, but they did confiscate tapes and files from the station's office. Soon after, on 29 August 2002, Radio VOP offices in Milton Park were bombed by unidentified assailants in the middle of the night. The building was demolished, though no staff members were harmed. However, the station is now back on the air in full swing with many new programs. Radio VOP advocates for the opening up of the airwaves in Zimbabwe.

Matters only continued to get worse as the station struggled to maintain its status as an independent voice for the people of Zimbabwe. In a series of attacks on the station and its personnel, Zimbabwean journalists Shorai Katiwa and Martin Chimenya were seized in June 2003 by supporters of President Robert Mugabe's ZANU-PF. The journalists were held and interrogated. Also, the police went to the home of Radio VOP coordinator John Masuku confiscating the radio station's office records and a computer used for programming purposes. Eventually, these items were returned and the journalists freed.

In early 2004, David Masunda, who is an Assistant Editor of the Zimbabwe Standard, became the new chairman of the radio station. The station's board of directors includes prominent human rights lawyer Arnold Tsunga as Vice Chairman, and Isabella Matambanadzo, the executive director of the Zimbabwe Women's

Resource Centre and Network, as secretary. John Masuku continues as the station's executive director.

In summer 2005 Radio Voice of the People opened its own website: **www.vopradio.co.zw**. Amazingly, the website is hosted in Zimbabwe.

Harassment by the Mugabe government continued with a raid on 15 December 2005 by Zimbabwean police and intelligence agents at the radio station's Beverly Court Building in Harare. According to press reports, the police arrived at the station's office with a search warrant to look for broadcasting and transmitting equipment. When staff members said there was no such equipment in the office, the police left and returned with a new, reworded search warrant allowing them to confiscate computers, other equipment, and station files and records. Police confiscated equipment and documents and held several Radio VOP staff members for questioning. They also wanted station manager John Masuku, but he was out of the country at that time.

After spending five days in jail, the employees were released. A High Court judge ordered their release because there were no grounds to keep them in detention. In making the determination, the Attorney General said the station's Executive Director and the board were the ones who were answerable.

After the release of the station's employees, Radio VOP Director John Masuku turned himself in, along with Board Chairman David Masunda. If found guilty of broadcasting without a license, Masuku would face a penalty of up to two years in jail. He was released on bail of 4 million Zimbabwe dollars. Masuku continues the work of Radio Voice of the People. During this difficult period, the transmissions from the Radio Netherlands Madagascar relay station were kept on the air by repeating programs previously broadcast.

Radio Voice of the People Today

The station's vision is *"a Zimbabwe that respects the right to information and enables citizens to freely exchange knowledge and ideas so as to make informed choices."* Its stated mission is that Radio VOP lobbies and advocates for political, economic, cultural and social development through alternative broadcasting.

Its objectives are to cover issues that would not make it to the state controlled electronic media in Zimbabwe, while giving Zimbabweans an opportunity to look at issues critically. Also, Radio VOP encourages the input of all Zimbabweans to share ideas and information, regardless of social, religious, or any other differences.

The station promotes and pro-

tects the principles of pluralism and diversity in the media. It encourages the development of participatory democracy in areas of health, governance, parliament, business development, gender and the environment, specifically following the land resettlement program. Radio VOP tries to present balanced and impartial news coverage for the overall development of the country socially, politically and culturally. Its last objective is health related in an effort to fight the HIV/AIDS pandemic through the accessible radio medium.
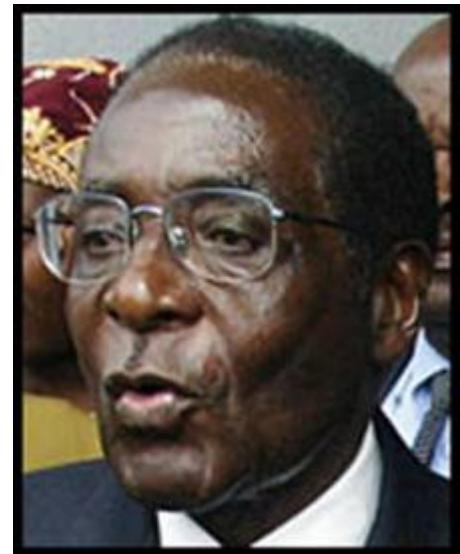
The station's day-to-day affairs are managed by John Masuku, who is a BBC-trained
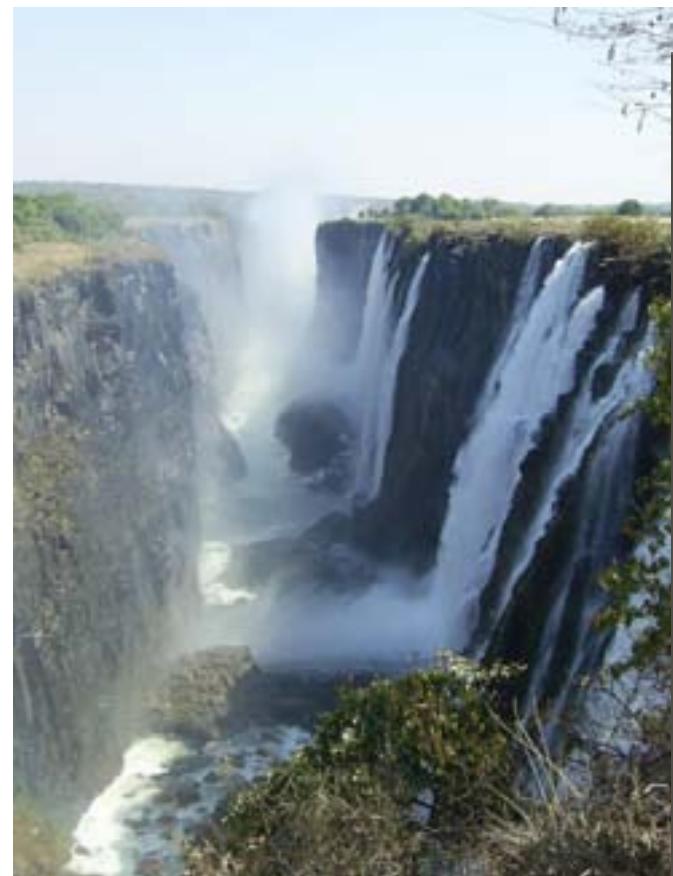
Victoria Falls forms part of the boundary between Zimbabwe and Zambia.

veteran broadcaster. He joined the station after working for the state-run Zimbabwe Broadcasting Corporation. Masuku leads a team of six full-time journalists and fifteen freelance correspondents based throughout Zimbabwe.

Radio VOP journalists present balanced news and programs, providing clarity and full information. The station tries to offer its listeners all points of view on any given issue. Radio VOP journalists are encouraged to establish networks with both government and civic society organizations in order to obtain balanced viewpoints.

Recently, senior government officials in Zimbabwe have confirmed that President Robert Mugabe's government is jamming foreign radio broadcasts into the country. It was the first official confirmation of the practice, which has been condemned by various freedom-of-the-press organizations. The Zimbabwe government is believed to be using Chinese equipment to jam the signals of Radio VOP, as well as the Voice of America's Studio 7 and London-based SW Radio Africa.

Last winter, Radio Voice of the People utilized Radio Netherlands 50 kilowatt transmitter at Talata Volonondry, Madagascar, to reach Zimbabweans with their message. Radio VOP was heard on 11,695 kHz from sign-on at 1700 to close-down at 1756 UTC – or from 1900 to 1956 Zimbabwe local time in the target listening area. Reception was fair to good most days, providing an exciting opportunity to listen and learn first-hand from a dissident voice about what is happening in this troubled African country.

The standard station identification that could be heard was as follows: *"This is Radio Voice of the People broadcasting from Zimbabwe everyday from 1900 to 2000 hours Zimbabwe time. Stay tuned for Zimbabwe's alternative voice. For more information write to Radio Voice of the People, P. O. Box 5750, Harare, Zimbabwe or e-mail vox pop zim, that's v o x p o p z i m at yahoo.co.uk."*

Radio VOP broadcasts in Zimbabwe's three main national languages of Shona, Ndebele, and English. Programming aims to enhance Zimbabwe's democracy with timely news and event-driven features. Program content includes ideas and information designed to foster the social, political, and cultural development of the country. Radio VOP journalists work to present issue-driven (rather than event-driven) news and programs and to provide clear, complete, and detailed information. VOP journalists are encouraged to establish networks with both government and civil society organizations in order to seek balanced viewpoints. Production teams monitor all the station's broadcasts, and criticism from listeners is taken seriously.

As turmoil in Zimbabwe worsens, Radio Voice of the People has extended its broadcasting activities. In March 2007, the station opened another shortwave broadcast from Madagascar to reach Zimbabweans in the morning hours. The new transmission opens at 0400 UTC – or 0600 local time – on 9,765 kHz with discussions about Zimbabwe in the Shona language. The broadcast closes at 0457 UTC, or 0657 local time.

Station identifications are easily understood and some English is used later in the transmission. The daily morning service was added due to the increased levels of political violence happening in the country.

Postal mail to the station in Harare is not reliable, although e-mail to offices in the United Kingdom does make it to the station. The station can be reached electronically at: *voxpopzim@yahoo.co.uk*. John Masuku, Executive Director Voice of the People, offers a brief reply to reception reports sent electronically. For those adventuresome enough to try the Zimbabwe postal system, the station's address is:

Radio Voice of the People
P. O. Box 5750
Harare
Zimbabwe

Special Recognition

In 2006, Radio Voice of the People was honored with the One World Media Special award for providing a daily program that is a lifeline for millions of listeners thirsty for a free media. The special achievement award was for an outstanding community media project or organization working on the ground in the developing world.

The One World Media Awards recognize the achievements of media professionals in furthering appreciation of international affairs. The award honors those who have highlighted issues of global justice, social and economic development and human rights, and who have done them in an engaging and challenging way. Upon receipt of the award at a ceremony in London, Executive Director John Masuku said, *"This is a great recognition of our determination to give a voice to the voiceless people of Zimbabwe."*

Radio Voice of the People continues its mission today, bringing news, debate, education, health and human rights information to a media-starved nation. Zimbabwe's government-controlled media provides the motivation that energizes the people behind the station's operation. Awards and recognition of their work only provides further encouragement to the personnel that make Radio Voice of the People an important source of information for the people of Zimbabwe.

Remember to send in those Radio Voice of the People logs to the *Broadcast Logs* column edited by Gayle Van Horn and QSL verifications to *QSL Report* also edited by Gayle. Good luck with this DX Target.

SCANNING ALASKA

By Bob Grove W8JHD

Bob and Judy at Exit Glacier

This past summer, Judy and I had an opportunity to tour spacious Denali National Park in our northernmost state. Denali is the original native name ("The Great One") for what is known geographically as Mount McKinley, the highest elevation in North America with breathtaking glacial features.

I enlarged this opportunity by seeing (or listening) how VHF/UHF communications are conducted in the wilderness areas as well as in more populated areas (See accompanying log).

Alaska is our largest state, 2-1/2 times the size of Texas, yet with a population well below that of Rhode Island, our smallest state. Needless to say, frequency congestion is not a problem!

I brought with me a Uniden BC92XLT (also known as a Radio Shack PRO – 83) in order to have the "Close Call" function, a handy way to find out what surrounding frequencies are active. With Close Call in operation, the listener can automatically display a nearby signal frequency as it transmits and monitor it at the same time. Close Call or its equivalent is being featured in virtually all up-scale scanners now in manufacture by Uniden and GRE.

Searching for Signals

Our first stop was the airport at Anchorage which is a medium-size city – at least compared with other cities in Alaska. A busy 800 MHz trunking system is in operation there, and public safety

The Alaska Railroad communications complex at the train station.
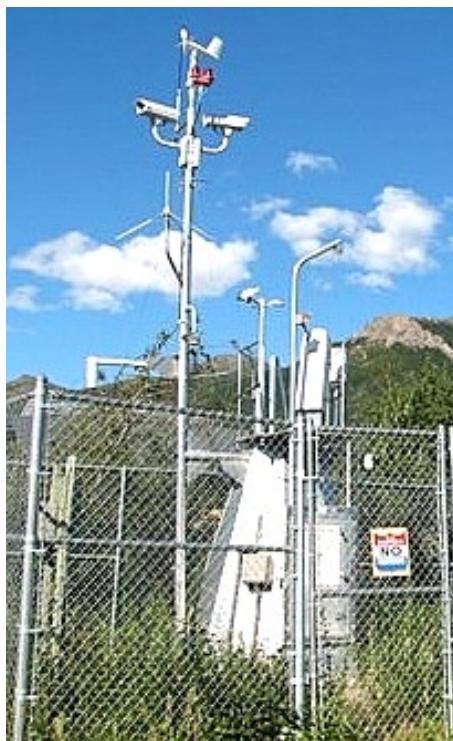
An FAA communications facility near the Alaska Railroad station.

Denali in its untouched natural beauty.

Our Alaska Railroad train winds its way through the mountains

comms as well as airport security and FEDEX transport could be heard in this mode. There were also a few isolated VHF high band circuits and even a rare UHF frequency or two to be copied.

Nearby Elmendorf Air Force Base was busy with their VHF-FM system, and the Alaska Railroad offered considerable listening as we were transported between Denali and Anchorage. Historically (and currently), the Alaska Railroad has played a vital role in Alaskan development, with 70% of the population lying within the railroad's corridor.

The railroad radio system is capable of coming up on about 15 channels, but rarely use more than four. Since railroads are allocated a vast number of 160 – 162 MHz frequencies for their exclusive use, I was surprised to hear them on 164 MHz as well.

Small air fields around the state were predictably using UNICOM frequencies, divided north and south of the Alaska Mountain Range. Because of the isolation of populated areas, only 25% of which are interconnected by roads, 1 out of every 58 Alaskans is a certified pilot; in some communities, the majority of the men are pilots.

Hotels and lodges were using everything from license-free MURS (Multi-Use Radio Service) and itinerant allocations at VHF and UHF, to CB and Family Radio Service (FRS). Telephones are interconnected over wide areas by UHF and microwave links.

National Park Service communications are now conducted on VHF high band analog, but will soon switch to a statewide digital network. NPS stations are interconnected by a statewide repeater backbone system.

A Remote Environment

Because of the scarcity of commercial grid power, solar cell arrays are very common, used for railroad signal lights and radio repeaters as well as NOAA weather data satellite uplinks.

While scanner monitoring may be sparse, there's nothing lacking in pure, panoramic beauty in our 49th state, and Judy and I are looking forward to returning to Alaska's scenic wonder.

ALASKA FREQUENCY LOG

Anchorage trunking (public safety, airport, FEDEX):
856.2125 856.3375 856.5625 856.8375
857.2125 857.3375 859.0625
859.9875

Alaska Railroad:
160.305 en route
61.250 porters
164.625 Engineer/Anchorage control
164.985 ops

Aircraft (small air fields):
122.8 122.9

Elmendorf AFB (Anchorage):
165.2625 Base ops
165.0875 Law enforcement (DVP)

Waterways:
156.800 (Ch. 16 calling)

Kantishna Road House:
CB channel 17

Talkeetna Hotel:
464.550

Anchorage PD:
460.250

Anchorage International Airport:
121.9 122.8 122.9 125.6 (ATIS) 126.4
126.8 129.5

The TWR Poster Antenna
Gain for Fringe Areas

By Ernie Franke
Chief Engineer, Trans World Radio

Picture, if you will, Juan Valdez arriving in your little village. He likes the coffee beans. Everyone breaks into celebration. Life is good!

It was also a happy day when the Poster Antenna arrived in the mail. Quickly papá tore open the simple mailing envelope and brought it near the family's small AM radio. What a difference as they heard the Spanish programs clearly!

The goal of Trans World Radio's Poster Antenna project is to provide a free-of-charge means of signal-enhancement to listeners in fringe areas of third-world countries.

What is a Poster Antenna?

Radios must be tuned. Trans World Radio (TWR) has devised a means of making a printed-circuit resonant circuit on each Poster Antenna, much like a tuning fork. The large printed-circuit spiral coil and printed capacitors form the resonant or "tuned circuit." This tuned circuit captures the weak radio waves and focuses the energy to a nearby, inexpensive radio. The signal level is increased over ten times, just what listeners in "fringe areas" need!

TWR centered its interest on the AM-band to cover the majority of what folks living in rural areas are listening to. The Poster Antenna offers a relatively inexpensive solution to sensitivity improvement, and it can be mailed directly to listeners to increase their signal level.

Loop Antenna has a Rich Heritage

The road leading to the development of the Poster Antenna has a long and rich heritage, dating back to the loop antenna of Marconi's day. Initially, all radios had large coils. Then along

Poster Antenna: Gain for Fringe Areas

came ferrite "loopsticks" to reduce the size of the radio. Today, hobbyists use the same technology developed for loop antennas to bring in DX stations on the AM and shortwave bands.

The large selection of commercially-available loop antennas, both passive and active (preamplifier), tells us that there is a demand for gain in the AM-band and that the products actually work. One can easily imagine the evolution of these loop antennas into our present-day, pretuned, thin, robust, mailable Poster Antennas.

Combating Inflation

As the price of energy escalates, station managers look for ways of achieving the same results with less prime power. As radio stations are economically forced to retreat, the Poster Antenna stands as a device to help maintain loyal listenership. Compared to the mega-dollars required for a larger transmitter/antenna system, the cost of fabricating and distributing Poster Antennas, at less than $10 each, is a bargain.

Listeners already know where and when to tune in to their favorite programs. They simply need help on signal strength and interference reduction. TWR would like to "win back" some of its faithful listeners who are now in the fringe areas of its reduced-power Caribbean antenna patterns.

How the Poster Antenna Works

If you're like me, you're leery of something that you bring near your radio and it "magically" works better. How can this be possible?

Let's think about a child's swing. It produces a large amplitude swing, but is propelled by small pushes of energy at just the right time. Well, the Poster Antenna works in the same way, receiving a weak radio signal (small pushes) at just the right time (frequency). This produces large oscillatory energy swings between the coil and the capacitor. The listener brings his radio near the coil and couples that energy swing to his radio.

Our Poster Antenna is fix-tuned to a single frequency. For TWR in the Caribbean, it's 800 kHz; the same frequency we've used since we began broadcasting from the island of Bonaire in 1964.

Bigger not always Better

The sensitivity of a loop antenna is simply the product of capture area (height and width of the loop), the Q (quality factor of the coil and capacitor), and the number of turns in the coil. To maximize the Q of the loop antenna, the coil wants to be as large as possible, with as many turns and as large a wire size as possible. Playing with the numbers for reasonable wire sizes, amateurs have found that the size is limited by the resultant inductance and inter-winding capaci-

tance needed for resonance in the AM band.
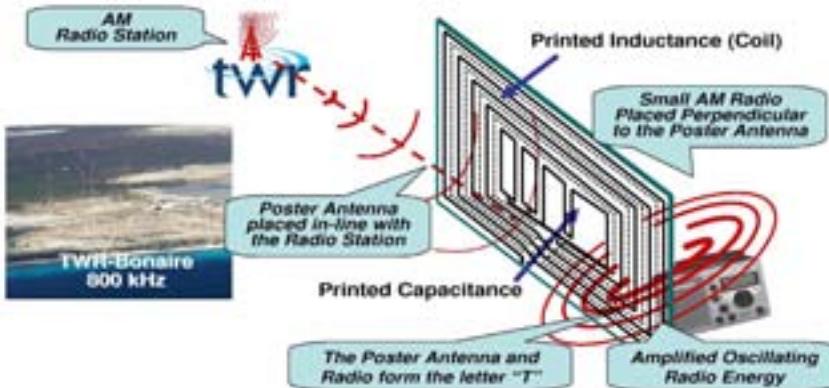
With an audience of predominantly listeners (not hobbyists), it was decided that Poster Antennas should be pre-tuned to a single channel (frequency) to avoid any extra knobs or adjustments. This means that, because of material and manufacturing variances, each antenna must be tuned. It also means that the dielectric properties of the materials must have long-term stability. This proves to be a problem with glass-epoxy printed circuit board (PCB) material FR-4, which absorbs moisture.

PC Board Material Selection

The most widely used PCB material is the glass-reinforced epoxy known as FR-4 or G10. At first it appeared to be just the right material for the Poster Antenna: abundant (95% of all PC boards), inexpensive ($3/sq. ft.), flexible, light-weight; but dissipation factor and moisture absorption killed its use. A suitable material must have low losses, not absorb water, be lightweight and sufficiently flexible for mailing but rigid enough to stand alone against a radio, and finally not cost too much. The Q (quality factor) of the capacitor, and of the inter-winding capacitance, is limited by the PCB material properties.

The Q is simply the reciprocal of the dissipation factor. With a dissipation factor of 0.02, the Q for FR-4 is limited to less than 50. An ideal material is polyethylene or polypropylene with an extremely low dissipation factor and almost no moisture absorption. Unfortunately, these materials lack sufficient rigidity and are not readily available in copper-clad laminate. (Please don't send us your old Tupperware containers for recycling.)

After evaluating the price, performance and availability of a host of materials, we chose Arlon 25N, a woven fiberglass-reinforced, ceramic-filled composite material engineered for use in microwave PCBs. Processing (etching, plating, drilling, routing) is consistent with processing for standard high-temperature, thermoset-based PCB substrates. We do not need any fire-retardant (FR) additive because the Poster Antenna is purely passive.

As the material approaches microwave-quality, the price rises rapidly. Future prices should drop and performance should improve as lower-loss materials find their way into high-volume applications, such as back-planes for high-speed computers, flexible micro-strip cables, and cellular base stations.

What Do Listeners Say about the Poster Antennas?

We conducted a trial survey by distributing samples among our English-speaking Caribbean listeners to gauge the response in fringe areas. The unquestionably positive response showed us the value of the product.

Location	Our Listeners' Comments
Trinidad	"Louder & clearer. Reception was noisy with co-channel interference."
Trinidad	"Works beautifully."
Trinidad	"Allows me to enjoy programs which could not be picked-up before."
Jamaica	"Decreases fading."
Jamaica	Weak signal became loud &clear. Morning program impossible without it.
St Lucia	"Works marvelous."
Anguilla	"Helped considerably. Listens with ease."
Puerto Rico	"Makes weak signal become loud & clear. Acceptable becomes good."
Puerto Rico	"Distinct improvement. Doubled signal strength."

More Gain for Smaller Radios

A recent signal-monitoring trip to Venezuela (see *MT Aug '07*) clearly showed the effectiveness of the Poster Antenna in fringe and beyond-fringe areas. Signal levels far down "in-the-noise" were made listenable when using the Poster Antenna.

The gain of the Poster Antenna is related to the relative capture area (9" x 12") versus the imaginary smaller capture area of the radio's internal ferrite loop-stick.

Interference Reduction

Half the battle of listening on the AM band is reducing the effects of on-channel interference and adjacent-channel splatter. The loop antenna can be positioned at right angle to an interfering station to achieve a sharp null for interference, even at the expense of amplification of the desired signal.

If You Can't Tune a Radio

. . . you can always "tune-a-fish." (Ouch,

sorry about that!)

TWR looked for something that was mailable in a standard business envelope. That's why we chose 9" x 12," using very thin (1/100") material, about the thickness of an IBM card. This gives it just the right flexibility to survive the postal system, while retaining sufficient rigidity to stand when placed next to a portable radio. We settled on 14 turns of 1/10" wide copper (2 oz) traces. We print (silk-screen) language-specific instructions on the front of each Poster Antenna.

Our first production Poster Antennas will be sent to our partner studios and offices in coverage areas that speak Spanish: Cuba, Venezuela, Columbia, and the Dominican Republic.

Even though Poster Antennas are mass-produced, they have slight differences. Each antenna is tuned to the exact frequency (800 kHz) of our station by abrading capacitor elements ("fingers" in above sketch) using a Dremel tool. The Poster Antennas can either be pre-tuned in Bonaire or in the host countries by local technicians, depending on the wishes and abilities of the host country.

On the Road to Mass Production

Having completed the engineering model, settled on a suitable dielectric material, and distributed Poster Antenna to a sample audience of listeners with positive feedback, we now enter into the project-funding phase leading to limited production (1 to 5 thousand pieces). Our goal is to provide a free-of-charge means of signal-enhancement to listeners in fringe areas of third-world countries.

Fine-tuning the loop with a Dremel tool.

We offer the Poster Antennas free to our listeners in the Caribbean and Central American region who simply write to us and request one. Because we do not solicit funds from our listeners, funding must come from churches and individuals. We ask only that the studio/office in each host country mail the Poster Antennas, improving the connection of the listener to the host studio.

By Ernie Franke
Chief Engineer, Trans World Radio
Bonaire, Netherlands Antilles
efranke@twr.org

Yard Work & House Work:
Take Your Radio Hobby Along

Do you find that day to day life really puts a crimp in your radio listening hobby? Whether working for a living, doing mundane chores around the house or the drudgery of doing yard work, is there precious little time left for your hobby?

I used to resent having to spend countless hours during the spring, summer and fall mowing the grass, hacking the weeds, raking leaves, trimming shrubs, and doing a myriad of other mind-numbing chores such as cleaning the rain gutters, washing windows, washing the car, and shoveling snow. They all took away from time more enjoyably spent playing with radios. Then there's the indoor house work such as vacuuming the floors, with a similarly obnoxious noise to mowing the lawn.

❖ Evolution of a Good Idea

I started out years ago trying to work outside doing chores and listening to the radio. That works great if you can set the radio up near where you're raking, cleaning gutters, etc. But, there was no chance to do that and ride the lawn tractor. I needed some way to be able to listen through headphones.

The first effort was to have a small cassette player (this was long before MP3 play-

AO Safety WorkTunes AM/FM stereo sound suppression headset. AM reception is nil unless you live near a major metro area. FM reception is marginal unless you live in a suburban location. But, reception from your nearby FM modulator will be just fine! Available for $59.99 from Northern Tool & Equipment. (Courtesy: Northern Tool.com)

ers) with programming I'd taped from various sources to which I could listen while mowing. That experiment met with mixed results: The headphones were no good at keeping out the roar of the mower and finally ended in disaster when I passed too close to a low branch on a tree. The tape deck, which was clipped to my belt, and headset were ripped off and somehow both found their way under the deck of the mower. BAM! End of experiment.

For a while I used a standard pair of noise suppression ear muffs which at least allowed me to think in peace. But the excruciating dullness of the task seemed to take even longer in the silence and I hated the idea of wasting time that could be spent listening to something ... anything!

Then about two years ago, as a gift, I received a pair of AO Safety WorkTunes® noise suppression ear muffs with a built in AM/FM radio. Now this was more like it! The noise of the mower could barely be heard through

the heavily padded ear cups and I could listen to the radio at a comfortable volume. There was a big problem, though. Reception for both bands is done by a small helically wound antenna just 7" long. From my location, AM reception was nil and FM reception, except for the most powerful stations (which never seem to broadcast music I like) was spotty. Down on the public broadcasting portion of the band, signals are notoriously weak and as the mower was turned one way or the other the signal would come and go. This made it really hard to keep up with news programs, talk shows, or anything else where following continuity of speech was necessary.

Still, I put up with this method for a year, flipping from station to station trying to find a song that didn't irritate or trying to avoid a long string of commercials. At least I wasn't listening to the roar of the mower! When I was close enough to the house I could pick up my own FM transmitter which was usually playing something interesting such as BBC World Service or Yesterday U.S.A. or any other source I could bring up on the stereo inside the house. The problem was that at any distance from the house the signal would disappear. I was back to trying to find something on the FM band.

Then this past spring I had a great idea: Since I already had an XM SkyFi satellite radio receiver in the house, why not get a mobile docking station and wire it up for the lawn tractor? When I got ready to mow the grass I could just pop the receiver out of the home docking station and slip it into the mobile cradle on the tractor. But, there were

Lawn tractor mounted XM Satellite Radio with SkyFi receiver, FM modulator and power adaptor. Output of the FM modulator is tuned in through the ear protector AM/FM headset. The FM modulator is attached to the tractor with Velcro®. (Courtesy: Author)

Radio Shack 12 volt D.C. Adapter (RS# 206-2272) costs $7.99 and lets you power your radio directly from the tractor battery. Strong adhesive backing makes it secure when attached to smooth metal surfaces. (Courtesy: Radio Shack)

Tiny, magnetic mount XM satellite radio antenna mounts easily to the metal engine cover on the lawn tractor. A mag/mount 2 meter whip or scanner antenna would mount as easily and feed your HT or scanner. You can transmit the audio output to a small FM modulator and listen on a noise suppression headset. (Courtesy: Author)

still a few wrinkles to iron out. How to mount the unit so that it stays on? (I didn't want the XM receiver to go the way of the old cassette!) How to power the unit? Where to mount the XM antenna? And, how to listen to XM on the tractor? The output from the SkyFi is so low that it wouldn't be heard on normal headphones.

❖ The Final Solution

The final solution was to install the mobile docking station the same way you would in a car, using the cradle with super

Wireless FM modulator such as this Akron wireless stereo music adaptor sells for $24.95 at www.myradiostore.com. It has eight preset frequencies and runs for many hours on two AAA batteries. (Courtesy: myradiostore.com)

strong adhesive that comes with the docking station and securing it to a very smooth surface. Next was to power the SkyFi receiver with a dc cigarette lighter adaptor wired directly to the tractor battery and also mounted on a smooth surface.

Next, I found an FM modulator powered by two AAA batteries which could be plugged into the output of the XM SkyFi. The power output of the modulator is very low, but easily received on the AO Safety headset. The magnetic XM antenna could be put on the top of the lawn tractor hood and the excess lead-in wire simply looped and stowed away. The complete installation is seen in the accompanying photos. The results are great! Now I can listen to BBC World Service, virtually any sporting event, Old Time Radio, countless commercial-free music channels and all the talk radio I can stomach.

❖ Alternatives

But, suppose you don't have an XM mobile unit or don't want to invest in a subscription? There are many other audio options. Using the same or similar power adaptor and FM modulator, you can listen to the output of anything you can lash to the tractor. You can listen to your scanner, 2 meter handi-talkie, portable shortwave radio, MP3 player, you name it! There was no interference from the engine of the mower on the XM unit, though there will likely be interference to a portable shortwave radio. Your MP3 player, scanner, and 2 meter HT shouldn't pick up any engine noise. The dc adapter and FM modulator will cost about $33 together.

Of course, there are a few concerns. Don't let wires interfere with the operation of the mower. Keep everything away from the heat of the engine. All components have to be secured to the body of the lawn tractor. Take it on a test drive once you think you have it secure. Drive around on a bumpy part of your lawn without the blades engaged. You'll soon find out what works and what doesn't. Engaging the blades will give it the real shake-down test.

I mounted the XM antenna at the front of the tractor so it would have clear reception. I found that even in the woods reception was fine. There are only a few places around the house where the signal is blocked. I took the precaution to strap rubber bands around the SkyFi receiver so that it wouldn't just pop out of the cradle in the event I would hit a hole or tree stump.

I also found that the modulator could be picked up by the headset 10 or 15 feet away. That means that I can take the weed trimmer out on the tractor and as long as I'm within range of the modulator, I can still hear the

programming while not having to hear the trimmer. The FM modulator has eight preset frequencies for the high and low ends of the FM band. There will be at least one frequency that will work well for you.

I have a pretty good-sized lawn and it generally takes two to three hours of non-stop mowing with a 42" wide deck and moving at a pretty good clip to finish the job. This mobile audio set-up has made it so that I'm a mowing fool. I can't wait to get out and listen!

But, it's not just for the great outdoors. Inside the house I can put any source through a similar FM modulator and use the headset to do equally wearisome jobs, such as vacuuming the floors or working in the shop where there's likely to be intermittent noise from a saw, drill, or router. To avoid disturbing others, I shut off the main speakers on the main stereo so the only audio is fed into the FM modulator.

Of course, if you're using a 2 meter HT you won't be able to work the local 2 meter repeater unless you have a really great noise-canceling microphone; otherwise, you'll just be transmitting the noise of the mower which won't endear you to anyone.

I found that I can go weeks on two AAA batteries with the FM modulator. Just remember to shut it off when not in use. I think you'll find year 'round use for this system; you'll spend more time doing jobs that need to be done, and, if not quite enjoying them, at least enjoying them much more than you used to!

ASK BOB

GENERAL QUESTIONS RELATED TO RADIO

Bob Grove, W8JHD
bobgrove@monitoringtimes.com

More on the screw-in fluorescent bulbs

In our September 2007 column, we discussed fluorescent bulb interference.

Dave Carberry, WA1IKN, responded to the item with his own experience. He replaced the incandescent bulb in his radio-controlled garage door opener with one of the new, screw-base, fluorescent lamps. He found that the remote control would no longer activate the opener, but the hard-wired switch on the wall worked fine. Dave correctly concluded that the fluorescent bulb was radiating interference, blocking the reception of the remote control, so he went back to incandescent. That worked.

When fluorescent, screw-in bulbs were first announced nearly two decades ago, there was considerable concern about radio frequency interference (RFI), because these things had oscillating circuitry in the 13.56 MHz range. The other day I made some measurements of RFI near several of the new fluorescent bulbs I have installed in my home. Depending upon the brand, they did radiate noise up to a few feet. Depending on the relative frequencies (including harmonics) of the bulb and the opener, it certainly could cause interference with the garage door receiver just inches away.

Q. *A lightning bolt has a massive current concentration; why doesn't it melt a lightning rod? (Mark Burns, Terre Haute, IN)*

A. While it's true that the current averages hundreds of thousands of amps, and no small conductor could carry that load, the discharge is instantaneous, not continuous – the burst doesn't have time to heat the conductor to its melting point.

Q. *I have a shortwave receiver and a couple of scanners; I've connected several antennas together to attach to each radio. Is there a switch available to allow me select any or all antennas, and does it have a lightning arrestor? (Jerry Dehoney, KA0QIZ, Flower Mound, TX)*

A. In most cases, simply bringing the leads from two or more antennas together at the receiver, assuming the antennas are resonant on similar frequencies, does more harm than good. The reason is that the signals usually arrive out of phase and cancel the signal voltage.

For the antennas to capture the signals and enhance reception, they must be in phase; that means proper separation from each other, identical coax lead length, and in the same plane so that the signal arrives simultaneously to the two antennas. This combination is rarely achieved without design.

Your best bet is to choose the best antenna for the job and connect it through low-loss coax. You can certainly use a switch to select any of several antennas; these are available from several *MT* advertisers, including Grove Enterprises (See one such switch at **www.grove-ent.com/SWC01.html**). You would need to ask for the appropriate adaptor(s) for your receivers and scanners to mate with the F connector on the switch.

Grove coax is in 50 and 100 foot length and has F connectors. Grove also sells separate antenna lightning arrestors/surge suppressors: **www.grove-ent.com/LAR.html**

Q. *In this day and age, why is cell phone privacy still an issue? Nearly all cell phone service is digital and signals are scrambled. Cell blocking only creates extra hardships on manufacturers. (Richard Houle, email)*

A. It's relatively easy for Congress to pass a law protecting privacy; it's nearly impossible to get them to rescind it. When the anti-cellular scanner laws were passed in 1994 during a particularly sensational period of cellular eavesdropping, virtually all cell phones were analog and easy to receive. But at this point in time, analog is rapidly becoming history and soon only digital will be heard (sometime after February 18, 2008) and it can't be descrambled.

Will the laws be changed? Not anytime soon, if at all. It would be difficult to make a case for such legislation because there would be no reason for scanners to include a range that has no receivable traffic, and because manufacturers have standardized their software and hardware designs to exclude the cellular frequencies in U.S. models.

Q. *How safe is it to run radios and/or computers from a typical 5kW home generator during power outages, and is the voltage 'clean' enough for this type of application? (Mike Elcsisin, KC2FTN, Watertown, NY)*

A. It should be perfectly safe. Most commercial gas-driven generators deliver decent voltage stability and waveform; although it will vary a few volts and a few hertz, it's close enough to maintain reliable power to the radio.

Some AC-operated (desktop/tower) computer's components, however, may be a little less tolerant of a change in waveform and voltage spikes. This is something you can only determine by experiment, but you won't hurt anything if the generator is operating normally.

If you note changes in the computer's performance while operating it on the generator, power it down and insert a line conditioner between the generator and the computer AC input. A line conditioner is a good idea anytime there is a question about the quality of the voltage and waveform of an AC line. A high-quality battery backup (uninterruptible power supply or UPS) may help as well.

Generally speaking, a laptop or notebook is far less vulnerable to line voltage changes because it doesn't depend on the direct presence of AC; the in-line AC/DC adaptor rectifies the incoming AC to low-voltage DC which charges the internal battery as well as runs the computer. Small changes in the AC voltage and frequency are correspondingly reduced.

Q. *Of the various indoor antennas for shortwave listening, which is the best? (Ralph Larson, Sr., Hector, MN)*

A. No indoor antenna will perform as well as an outdoor antenna due to the shielding, pattern distortion and interference caused by household metal, wiring and electronic and electrical appliances.

The four indoor antennas carried by Grove Enterprises are the AOR LA380 loop, H800 Skymatch active whip, MFJ 1020C antenna preamplifier, and the passive Hidden Flex-Tenna wire. For attic installation or hanging outside the window, the Hidden Flex-Tenna is a good bet at the lowest price; to null out interference or peak for maximum signal reception, the rotatable LA380 is a good choice but more pricey; if you can mount it on a chimney or porch rail, the H800 is hard to beat; and as a versatile desktop active antenna with tunable preselector, the MFJ1020C is a popular seller.

More on Propagation

Just read your September *MT Help Desk* reply to Everett Seidenberg AG4UM about propagation displays. If you use Mozilla Firefox for your browser you can download add-ons, small programs that run as subroutines while you are online. I use two: NOHR Propfire and Sun Cult.

Propfire displays the current Solar Flux, Planetary A index, and the K index. When the cursor is placed on the Sun Cult icon it displays sun rise and set, twilight start and end, moon phase, next full moon, and moon rise and set times. There are dozens of other add-ons available, but these two are very handy for ham radio operations. Thought you and *MT* readers might find this useful. (*Pete Davis, KB1ONC via email*)

Q. I may have missed it, but I've been a subscriber to Monitoring Times for several years and did not see the frequency shift for Progress Energy. When my power went out the other day I picked up the scanner and listened to the 421 MHz band for the usual trucks and dispatcher and heard nothing. I suspect they have moved, maybe to the 800 MHz band, but have not seen anything about this. Do you have any insight? (William Schmidt, Raleigh, NC)

A. Progress Energy has moved to a 900 MHz Motorola Trunk System. Here are the particulars of everything I have to date.

Jacksonville NC (site 1)
    936.9000 937.4250 938.4000 938.9500c
    939.4625c
Jacksonville NC (site 2)
    937.4250 938.4000 938.9500c 939.4625
Wake County-Garner Area
    935.2500 935.4875 935.7500 936.2500
    936.7500 937.2500 938.2500c 939.2500
Wake County-Method Rd (Hillsborough St Area)
    935.4250 935.9125 936.9625 937.4250
    938.4625 939.0000c
Kingstree, SC
    935.4250 936.4250 938.5000c 938.8875c
Asheville NC
    935.9625 936.9625 937.9875 938.8875
    939.9625c
Kornegay NC
    935.9000 936.4325 936.9125 939.4875c

Talkgroups
16	Service North Raleigh, NC area
48	Construction South Raleigh, NC area
80	Service South Raleigh, NC area
112	Service Apex, NC area
176	Construction Apex, NC area
816	Lee Steam Plant (Goldsboro, NC) Railroad Ops
32912	Line crews Goldsboro, NC area
33136	Service Kinston, NC area
33168	Relay crews (unspecified area)
34572	Service Wallace, NC area
48080	Asheville Operations East Channel
48176	Asheville DCC/Storm Center
48208	Asheville Operations Line Crews
48752	Asheville Operations West Channel
49776	Asheville Operations Service Techs

Q. I just read your September Milcom column. What kind of systems are the DoD systems you listed? Motorola? EDACS? LTR? (Jeff, KF6NXQ via email)

A. All of the 380-400 MHz DoD LMR trunk systems should be programmed as a Motorola P25 system in your scanner. We have not seen any EDACS or LTR systems reported to date and won't since those systems are not P25 and DoD is only using that modulation type in this UHF band.

Q. Who or what is Hilda? (Anonymous via email)

A. Hilda is the call sign of the US Air Force Air Mobility Command (AMC) Tanker Airlift Control Center (TACC), located at Scott Air Force Base, Illinois. These TACC facilities provide worldwide command and control for AMC missions, while the theater Air Mobility Control Center (AMCC) provides command and control for theater operated missions.

Either the TACC or appropriate AMCC can be contacted for airlift movement reporting and/or assistance directly through the DoD Global HF radio stations. The voice call sign "MAINSAIL" may be used for establishing initial contact. Following initial contact, aircrews may request a phone patch to the desired center.

Center	Call Sign
Elmendorf AMCC	DENALI
Osan AMCC	BRICKWALL
TACC East Cell	HILDA EAST
TACC West Cell	HILDA WEST
USAFE UTRACC	TRACKER

Frequencies on which you can catch communications to Hilda include: 4724.0 6712.0 6739.0 8992.0 11175.0 13200.0 15016.0 kHz (USB)

Q. Do you know of an antenna designed specifically for milair on a BNC connected handheld scanner? (Bob Paciorkowski via email)

A. Afraid not, Bob. Pretty much any antenna you would snap on the scanner is going to give the same results unless it is one cut for a specific band. I use and recommend the Austin Condor whip antenna and get pretty good results on any frequency above 100 MHz. It is available from Grove Enterprises for $29.95 plus shipping. Order antenna ANT14.

Q. I live in Las Vegas, Nevada, which is rich in Red Flag exercises and Nellis AFB communications that keep me glued to my scanners. I was talking with a friend a few days back about my many trips back and forth from Las Vegas and Laughlin Nevada. I was working for a motor rewind company in the '70s, that took on the job of rewinding the hydro-electric generators at Davis Dam. I remember passing the USCG LORAN station at Searchlight, Nevada. I would be listening to the news station KNXT 1070 and when I passed the LORAN station, I would hear the LORAN signal over the news broadcast.

I have not been down that way in a few years now, but my friend said he thought that working at that station today would be very boring. I told him, not so, 'cause USCG deactivated the LORAN stations. He told me that he believed that they are still in operation as a back-up to GPS. I am wondering if that is true and where I might get more info.

If LORAN is still being used, it may make for an interesting article. At any rate, where could I get info and operating frequencies? (Howard Allshouse via email)

A. Look no further, Howard. LORAN (LOng RAnge Navigation) is still operational. I recently ran a piece on my *Btown Monitoring Post* blog about LORAN (**http://monitor-post.blogspot.com/search?q=loran**). Last year, the Coast Guard, which operates and maintains LORAN transmitting stations, proposed to pull the plug on this technology. The Aircraft Owners and Pilots Association (AOPA) recently pointed out that LORAN may still be needed to play an important role in the nation's navigation and airspace surveillance system. The Coast Guard then decided to take a more studied approach. Recently, the Coast Guard asked users to weigh in on its future.

If it's retained, the Coast Guard listed options on how to manage it. LORAN was popular until GPS came along. GPS has proven to be easier to use and more affordable for primary navigation. It's premature to talk about management options until the FAA and Coast Guard decide if LORAN is suitable for aviation use as a back-up to GPS.

LORAN is a terrestrial navigation system using low frequency radio transmitters that use the time interval between radio signals received from three or more stations to determine the position of a ship or aircraft. The current version of LORAN in common use is LORAN-C, which operates in the low frequency portion of the radio spectrum from 90 to 110 kHz. Many nations are users of the system, including the United States, Japan, and several European countries. Russia uses a nearly identical system in the same frequency range, called CHAYKA.

SCANNING REPORT
THE WORLD ABOVE 30MHZ

Dan Veeneman
danveeneman@monitoringtimes.com
www.signalharbor.com

The Search for Meaning...

Scanner listeners continue to encounter the challenge of monitoring the new digital public safety radio systems. This month we answer reader questions about Motorola ASTRO, Project 25, and other jargon related to this increasingly common technology.

❖ Motorola Astro

I am new to scanning and wanted to know if the scanners that can decode analog and digital signals can also decode the digital voice transmissions of the Motorola Astro?

D.J. via the Internet

ASTRO is a marketing term used by Motorola to describe a line of public safety radio equipment that sends some or all information in digital form. ASTRO networks are capable of carrying voice information in both analog and digital form.

Analog radios carry sound from the sender to the receiver via a transmitted signal that is continuously varied in proportion to the sound. This is the oldest and most common means of conveying speech via radio.

Digital radios, by comparison, first convert the sound into a binary stream of 1's and 0's and then transmit the stream. This conversion is done in a device called a *vocoder*. There have been many vocoders used over the years, but there are a couple of common ones in use in ASTRO systems.

The first generation of ASTRO equipment used a vocoder that produced digital voice using a method called VSELP, or Vector Sum Excited Linear Prediction. VSELP is proprietary to Motorola and is not compatible with other manufacturers. It is becoming less and less common as agencies transition to newer technology, which is a good thing for scanner listeners since there is no consumer-level product available that can monitor VSELP activity.

ASTRO 25 is the Motorola marketing term for their APCO Project 25-compliant products. Project 25 (P25) is an effort by the Association of Public Safety Communications Officials International (APCO) to standardize the way public safety radio equipment operates. P25, among other things, defines a Common Air Interface (CAI) that specifies how radios should send and receive voice traffic. CAI uses a vocoder called IMBE (Improved Multi-Band Excitation).

P-25 Trunked System Channels
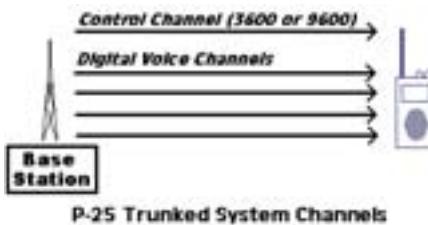
❖ ASTRO Trunking

ASTRO 25 networks using the CAI standard can operate in conventional mode, meaning that traffic on the system is not trunked. Users are assigned to specific radio frequencies and stay on those frequencies while they're participating in a conversation.

ASTRO 25 networks can also operate in one of two trunk modes. The first uses a Motorola trunking standard referred to as "3600-baud," which sends control channel information at a data rate of 3600 baud. You'll find this on Motorola Type II trunk radio systems. The second trunk mode is P25 digital trunking, which uses a standardized digital format on the control channel. It's sometimes referred to as "9600-baud," since data is sent across the control channel at a 9600-baud rate.

All of the scanners sold as "digital-capable" are able to monitor P25 voice activity. However, only the newer digital scanners are able to follow the P25 digital trunking standard. So, if you have one of the early digital scanners, such as the Uniden BC250D or BC785D, you will be able to hear the digital CAI voice activity but will not be able to track any trunked conversations on systems which use P25 digital trunking.

❖ Drummond Island, Michigan

I just read your 2005 introductory trunking article.

I live on Drummond Island in Chippewa County, part of the eastern Upper Peninsula of Michigan. I know my county has gone to 800 MHz band for all public resources including County Sheriff, State Police, City Police, EMS, etc. I can see a tower out my front window and I know there is a tower on Drummond near the center of the island.

I also have a map of the frequencies used in Michigan and the frequencies that appear at the two towers closest to me.

Before I spend $500++ on a digital scanner and put up an antenna, I need to know if our county uses encryption. If so, my investment will be useless. The Radio Shack folks in Sault Ste Marie are unclear about this point. Apparently, some agencies encrypt and others do not.

Can you give me any info on all this?
Ken Walker, Drummond Island, MI

Chippewa County is located in the eastern part of Michigan's Upper Peninsula and is home to nearly 40,000 residents. Drummond Island is at the eastern end of Chippewa County, adjacent to the Canadian border and has a population of just under 1,000 people.

Most of the public safety activity in Chippewa County occurs on the Michigan Public Safety Communications System (MPSCS), a statewide trunked radio network operating in the 800 MHz frequency band. Nearly 1,000 agencies now use the system, totaling more than 36,000 radios. Construction of the MPSCS began in 1994 and by 2002 was in operation on 181 repeater sites. Since then, as additional counties and local agencies join the system, more repeater sites are added.

MPSCS follows the specifications laid down in the APCO Project 25 standards. This means that voice traffic on the system is in digital, rather than analog, format. This means that you will need a relatively new scanner in order to monitor system activity. Fortunately for hobbyists, there are a number of scanners now on the market that are capable of following APCO Project 25 systems.

Maker	Models
GRE	PSR 500, PSR 600
Radio Shack	PRO-96, PRO-2096
Uniden	BC296D, BC796D, BCD396T, BCD996T

Although Project 25 provides a standard for encrypting the digital voice traffic, most agencies on the MPSCS do not, as a normal course of operation, actually encrypt their conversations. There are talkgroups within some law enforcement departments that may use encryption to protect very sensitive activity – surveillance, narcotics investigations, and so on – but most scanners will indicate when this occurs. I do not have any information that indicates Chippewa County uses encryption.

There is a web site with an interesting interactive mapping tool specifically for MPSCS. At

www.radiowurx.com/mpscs you can see a map of Michigan with each of the repeater site locations indicated by a blue or red triangle. Clicking on a specific triangle brings up information about that tower, including the location and frequencies in use at the site.

There are three towers in eastern Chippewa County, including Lincoln on Drummond Island itself, as follows:

Location	Frequencies
Lincoln	866.4625, 867.4625, 868.4625 and 868.9625 MHz
Detour Village	867.4000, 867.9250, 868.4250 and 868.9250 MHz
Sault Ste. Marie	866.8000, 867.4875, 867.9875, 868.4875 and 868.9875 MHz

Another tower you might be able to hear is Hessel, in Mackinac County, operating on 866.9875, 867.4750, 867.9625, 868.5375 and 868.9500.

On the MPSCS there are talkgroups specifically assigned for activity in Chippewa County:

Decimal	Hex	Description
5068	13CC	Special Events 1
5069	13CD	Special Events 2
5087	13DF	Countywide Common (Mutual Aid all agencies)
5091	13E3	Central 9-1-1 Police - Dispatch
5162	142A	Soo Locks Security 1
5163	142B	Soo Locks Security 2
6047	179F	Sault Tribe Police
6113	17E1	Sheriff Dept. - Proprietary
6114	17E2	Sault Ste Marie Police - Proprietary channel
6115	17E3	Bay Mills Tribal Police - Proprietary channel
6116	17E4	Central 9-1-1 Police - LEIN
6152	1808	Central 9-1-1 Fire/EMS - Dispatch
6153	1809	War Memorial Hospital HEARN
6154	180A	Emergency Management
6289	1891	Sault Ste. Marie City Fire - Proprietary

In addition to MPSCS, there are a few conventional (non-trunked) radio frequencies carrying analog traffic in Chippewa County:

Frequency	Description
151.010	Road Commission
154.725	Drummond Township Police
154.115	Eastern Upper Peninsula Transit Authority (EUPTA)
155.310	Sheriff
155.415	Police (Mutual Aid)
155.535	Police (Dispatch)
155.775	Fire (Paging)
155.865	Michigan Emergency Police Service

Station (statewide)
156.180   International Bridge Authority

❖ Colden, New York

I've enjoyed reading your information on trunking. I've just joined the local fire department in Colden, New York. My pager is not working and until they get it reprogrammed I am depending on my scanner to hear calls. However, I only seem to hear my chief communicating with fire control after the dispatch has gone out. I know the frequency that control is supposed to be using, and that is the frequency that I hear the radio communications between our trucks and various chiefs, but I never hear the people at fire control. We use Hamburg Fire Control in Erie County, New York. I'm wondering if you can tell me anything about the system there that will help me out. The scanner I am currently using is a Radio Shack Pro-82.

Jeff in Colden, New York

Colden is located in Erie County, about twenty miles south of Buffalo. As is common with many small towns relying on volunteers, fire dispatch is done from a "consolidated" center serving many departments in the county. Volunteers carry a pager that alerts them to emergencies. These alerts are sent out by a dispatcher at the center and are made up of two parts. The first part is a series of tones sent in rapid succession. Second is a voice message from the dispatcher, identifying the emergency and providing whatever additional information the volunteers may need.

Because these "tone outs" are transmitted on a radio frequency that is shared among several departments, a pager must have the ability to identify dispatches meant for the wearer while ignoring those that are meant for other departments. The pager does this by listening for a specific set of tones.

Individual fire departments will each have their own unique set of tones, allowing the dispatcher to alert members of a particular department without bothering volunteers from other departments. Each pager from a particular department is programmed to respond only to its assigned set of tones. When it hears those tones, it activates the speaker and allows the wearer to hear the dispatch instructions.

For the town of Colden, fire dispatch is done via the Public Safety Dispatch Center in nearby Hamburg. Hamburg Fire Control provides dispatch services to several volunteer fire departments, including the towns of Boston, Colden, Eden, Hamburg and Blasdell. Dispatches can be heard on low band at 46.20 MHz.

There are a number of other low band, VHF and UHF frequencies with county activity.

Frequency	Description
45.88	Intercounty Mutual Aid
46.20	Fire (Hamburg)
46.22	Fire (Mutual Aid)
46.24	Fire (East Aurora)
46.26	Fire (Amherst)
46.28	Fire (Cheektowaga and Depew)
46.32	Fire (Springville)
46.38	County Fire Control
72.72	Elma Tower Repeater link for East Aurora Fire Control
75.72	Elma Tower Repeater link for East Aurora Fire Control
154.025	Hamburg Town Services
155.370	Police Intersystem (statewide)
155.790	Hamburg Police
425.2750	County Fireground 1
425.3250	County Fireground 2
453.5125	Sheriff
460.0500	Sheriff
460.0750	Sheriff
460.2000	Sheriff
460.4000	Sheriff
460.4500	Sheriff (Dispatch)

There is also a single frequency, 154.2575 MHz, licensed to Aurora Colden Fire District #6 and transmitted from a tower on Davis Road in West Falls.

Finding Frequencies

The Radio Shack PRO-82 Jeff mentions is a handheld scanner first introduced a few years ago covering frequencies from 29 to 54 MHz, 108 to 174 MHz, and 380 to 512 MHz. It can store up to 200 channels and can only monitor conventional (non-trunked) analog transmissions. Fortunately for Jeff, it appears that the activity he's interested in is all conventional analog anyway.

A handful of more recent scanners have an interesting feature to help identify otherwise unknown frequencies. Uniden markets it as "Close Call" and Radio Shack calls it "Signal Stalker." The new GRE scanners call it "Spectrum Sweeper." This feature works by quickly scanning for strong signals in the immediate area. If a signal is found, the frequency can be displayed and the scanner tuned to that frequency.

Feature	Manufacturer	Models
Close Call	Uniden	BC72XLT, BC92XLT, UBC3500XLT, BCT15, BR330T, SC230, BC246T, BCD396T, BCD996T
Signal Stalker	Radio Shack (GRE)	PRO-433, PRO-528, PRO-83, PRO-84, PRO-2051, PRO-97, PRO-2054, PRO-2055
Spectrum Sweeper	GRE	PSR100, PSR300, PSR400, PSR500, PSR600

This signal capture capability is also available on various devices from a company called Optoelectronics, including their Scout, Digital Scout and Spectrum Scout products.

The New York State Police also use VHF frequencies, specifically:

Channel	Frequency
1	155.505
2	154.665
3	154.695
4	155.565
5	155.370
6	155.070
7	155.475
8	155.625

However, there are efforts underway that will change how New York public safety agencies communicate.

New York Statewide Wireless Network

Although the PRO-83 can monitor most of the activity in the rural areas around Buffalo, a few years from now it may no longer be able to follow transmissions from state and local public safety agencies.

Two years ago the state signed a $2.1 billion contract with M/A-COM to build a digital radio network using frequencies in the 700 and 800 MHz bands. More than 1,000 repeater sites are planned, with connections to ten regional dispatch centers. Two main control centers will be located in Albany and Buffalo. The goal of the new network, like every other statewide network, is to provide a common platform for different agencies to communicate. This *interoperability* capability would allow federal, state and local agencies to all work together seamlessly during emergencies.

New York is currently in the process of building out the Statewide Wireless Network (SWN). The project divided the state into 12 regions and is scheduled to have all of them complete and operational by 2010.

Unfortunately for scanner listeners, the New York system will use a digital scheme called Open Sky that cannot be monitored by any consumer scanner currently on the market.

Chemung County, New York

On the New York border with Pennsylvania, Chemung County isn't waiting for the SWN. The county is home to about 91,000 residents, about a third of whom live in the county seat of Elmira.

The Chemung County Sheriff's Department had been experiencing problems with their old analog radio system, including poor coverage in outlying areas. They were also experiencing interference from nearby Cortland County. So, after spending nearly $2 million, in August they finally switched over to new digital radios. However, unlike many other new systems, the county continues to use the same VHF frequencies rather than move up to 800 MHz.

The new equipment uses the Common Air Interface (CAI) as defined in the APCO Project 25 standards. This means the voice traffic carried by the new radios is in digital format rather than the old analog form.

The following are conventional (non-trunked) frequencies reported to be active in the county. I don't have confirmation about which frequencies have moved to digital, but I expect that the old analog dispatch frequency of 154.875 MHz is now carrying CAI traffic.

Frequency	Description
45.60	Emergency Management
45.64	Fire (Tactical)
45.88	Fire Mutual Aid (statewide)
46.14	Fire (Fireground)
46.18	Fire (Dispatch)
46.22	Fire (Vehicle-to-Vehicle)
46.32	Fire (Fireground)
46.34	Fire (Fireground)
151.0325	Public Safety
151.1975	Public Safety
154.1375	Public Safety
154.7625	Public Safety
154.0550	County Services
154.8450	Public Safety
154.8750	Sheriff
155.2500	Public Safety
155.2800	Emergency Medical Services
155.3400	Emergency Medical Services
155.3700	Sheriff Mutual Aid (statewide)
155.4000	Emergency Medical Services
155.4225	Elmira Police
155.4900	Elmira Police
453.0750	Elmira Fire (Fireground)
453.1250	Elmira Fire (Inspections)
453.8500	Elmira Fire (Dispatch)
458.8500	Elmira Fire (Fireground)

❖ Heath, Ohio

The town of Heath, Ohio, located in Licking County about 35 miles east of Columbus, recently decided to move ahead with a proposal from E.F. Johnson to replace their aging Motorola network. The town is home to about 8,500 residents, but local industry brings the daytime population to over 35,000. The town has a police force of 19 sworn officers and a fire department with nearly 40 firefighters and paramedics.

A lack of replacement parts for their existing site controller has limited the town's radio system operation to just two frequencies. To date this hasn't created a problem, but in a crisis the two channels might not be able to handle all of the radio traffic from public safety personnel.

The new system, priced at about $370,000, includes 41 portable and 11 vehicle-mounted radios and associated equipment, along with a new dispatch console. The proposal outlines an installation schedule that should be complete before the end of the year. It also includes a priority effort to restore the third frequency to full operation. The city is also looking at upgrades to their existing pair of repeater site antenna towers.

The current Heath system is Motorola Type II trunked radio network licensed for the following three frequencies: 856.2125, 857.2125 and 858.2125 MHz. Talkgroups on the system include:

Decimal	Hex	Description
8016	1F5	Police Dispatch
8048	1F7	Police Tactical/Car-to-Car
8080	1F9	Police Tactical/Car-to-Car
8976	231	Fire Dispatch
9008	233	Fireground
9040	235	Fireground

That's all for this month. More information is available on my web site at **www.signalharbor. com**, including detailed APCO-25 information and a scanner comparison guide. Please send your questions, comments and frequency lists to me at *danveeneman@monitoringtimes.com* . Until next time, happy scanning and Happy Thanksgiving!

UTILITY WORLD

HF COMMUNICATIONS

Hugh Stegman, NV6H
hughstegman@monitoringtimes.com
www.ominous-valve.com/uteworld.html
http://mt-utitlity.blogspot.com

Summertime in Antarctica

Our readers in the Northern Hemisphere are probably thinking about the coming of winter, but down south, it's springtime. This means that Antarctica is gearing up for the summer. It's especially significant right now, because the 2007-2008 summer is part of the International Polar Year which began last March. The rapid disintegration of Antarctic ice sheets, and its possible link to global warming, has added considerable urgency to research efforts.

Our esteemed co-editor Larry Van Horn recently posted a good article on United States Antarctic operations to his Milcom blog at **mt-milcom.blogspot.com.** Check it out.

The major US military effort, of course, is the annual Operation Deep Freeze. This year's winter fly-in season (WinFly) concluded at the end of August. Each year, WinFly brings in personnel and equipment to prepare for summer operations. Summer personnel include electronic technicians from Raytheon Polar Operations, and scientists from a variety of organizations overseen by the National Science Foundation (NSF).

Annual Deep Freeze support operations include building an ice runway at the McMurdo base and clearing a shipping channel. Airplanes capable of landing on the ice identify as SKIER plus two numbers. Channel clearing was once divided between the US Coast Guard's polar-class icebreakers *Polar Sea* and *Polar Star*. However, it was more recently shifted to the NSF, which contracts with any available vessel. At press time, the *Polar Sea* is damaged, and the *Polar Star* is in "caretaker" status with only a skeleton crew. A larger ship, the *Healy*, is unavailable.

Larry also links to an excellent field manual given to these personnel by the United States Antarctica Program (USAP). It has a full description of radio procedures and operation. This document is at www.usap.gov, under "Travel & Deployment."

The high-frequency (HF) transceiver issued to Antarctic parties venturing into the field is the 20-watt PRC-1099, programmable from 1600 to 30000 kilohertz (kHz). Primary mode is upper sideband (USB). The 50-pound field kit includes a plug-tunable dipole with supports for "V" or straight configuration, a spare battery, and a solar panel for charging.

Table 1 lists the frequencies used in these radios.

Table 1: Antarctic HF Frequencies

MCMURDO STATION
4770.0   Ross Island and Dry Valley Field Parties
5100.0   Air-to-Ground
5400.0   Scott Base Field Parties
7995.0   Remote/South Pole
9032.0   Air-to-Ground
11553.0   Remote Field Parties

PALMER STATION
4125.0   Secondary USAP Field Parties
11553.0   Primary USAP Field Parties

GROUND TO AIR
4770.0   Fixed-wing secondary
9032.0   Fixed-wing primary
11533.0   Fixed-wing secondary

❖ More Google Earth Exploring

Back in April we introduced Google Earth and its ability to zoom around and into almost any spot on the globe. Virtual tours also work to a lesser extent on Google Maps and related programs that display satellite views searchable by latitude and longitude. My copy of Google Earth had no problems plotting the following coordinates when they were entered exactly as shown here.

40° 52' 52.00" N, 72° 38' 52.00" W

These "official" coordinates for the New York Radio aeronautical facility put you in the Long Island woods, south of Riverhead, NY. However, check out the clearing directly east, which a Google Earth user has labeled "mysterious antennae."

There's really nothing mysterious about them. Eleven large antennas serve four Major World Air Route Area (MWARA) nets, plus High-Frequency Data Link (HFDL), Long Distance Operational Control (LDOC), and VOLMET (aviation weather). Most of these are wire log periodics hung from tall towers, backed by 5000-watt transmitters. They're operated by Aeronautical Radio, Incorporated (ARINC).

Everyone likes frequencies, so here are the ones used at this site. You'll hear ground-air communication on these, which are all kilohertz (kHz), and upper sideband (USB).

North Atlantic (NAT-A) net: 3016, 5598, 8906, 13306, 17946, 21964
NAT-E: 2962, 6628, 8825, 11309, 13354, 17952
Caribbean CAR-A: 2887, 5550, 6577, 8846, 11396, 13297
CAR-B: 3455, 5520, 6586, 8918, 11330
LDOC: 3494, 6640, 8933, 11342, 13330, 17925
VOLMET: 3485, 6604, 10051, 13270

You can find all the information you'll ever need on page 32 of the document available at **xpda.com/flyingtoeurope/HFGuidance.pdf** As noted there, the control point and administrative headquarters for the station are in the New York Communications Facility near the Federal Aviation Administration control center at the airport in nearby Bohemia, NY.

40° 55' 15.00" N, 72° 23' 41.00" W

This is the New York Radio receiving site, just off Wireless Way, amid the mansions north of Southampton. You can't miss the huge old radio tower here. It's possible to make out a few other antennas, but not with any kind of resolution. Again, wire log periodics are used. Multi-couplers send the signals to at least 40 receivers.

40° 55' 25.32" N, 72° 56' 07.39" W

As long as we're on Long Island, here's the center of a huge, wooded area that used to be RCA's massive Radio Central near Rocky Point, NY. It was first opened in 1921, around the time the US government declared such competitors as Marconi and Telefunken to be unwelcome foreign interests in a strategic industry.

A good history of Radio Central is at **www.geocities.com/ResearchTriangle/Forum/3531/radio.html** .

40° 56' 52.93" N, 72° 53' 53.09" W

This is a historic old building, right across from the northeast corner of the Radio Central land. It remains largely intact despite being surrounded by the newer factory complex you see here.

This is what's left of Nikola Tesla's fabled laboratory at Wardenclyffe. Construction of a "World Wireless Transmitting Station" began here in 1901, but money ran out and it was never finished. The legendary tower was dynamited for scrap in World War I, though some of its deep foundations remain.

The most recent owner, a photographic company, used the tower's huge ground system as a chemical pit. Following a major environmental cleanup, the site now awaits an uncertain fate. Several groups are trying to establish it as a Tesla museum. More on all this is at **www.teslascience.org/index.html** .

Tesla has become an almost superhuman figure, both in the history of science and in various lurid conspiracy theories. Wardenclyffe could be a major cultural attraction, if done well.

Let's hope it is, and see you next month.

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U TILITY WORLD

UTILITY LOGS

Hugh Stegman

ABBREVIATIONS USED IN THIS COLUMN

AFB	Air Force Base
ALE	Automatic Link Establishment
AM	Amplitude Modulation
ARQ	Automatic Repeat reQuest
AWACS	Airborne Warning And Control System
CAMSLANT	Communication Area Master Station, Atlantic
CAMSPAC	Communication Area Master Station, Pacific
Coquelet-8	Algerian 8-tone synchronous teleprinting
CW	On-off keyed "Continuous Wave" Morse telegraphy
DSC	Digital Selective Calling
E03a	UK MI6/SIS, musical callup and female voice, Guam
E06	Russian numbers, female in English, 5-figure groups
E07	Russian numbers, male in English, 20-minute intervals
E11	Unknown "Strich" family, null-message format in English
EAM	Emergency Action Message
FAX	Radiofacsimile
FBI	US Federal Bureau of Investigation
FEC	Forward Error Correction
G06	Russian numbers, female in German, 5-figure groups
HFDL	High-Frequency Data Link
HF-GCS	High-Frequency Global Communication System
JSTARS	Joint Surveillance Target Attack Radar System
LSB	Lower Sideband
M08a	Cuban 3-msg CW/MCW, ANDUWRIGMT = 1-0
MARS	Military Affiliate Radio System
Pactor	Packet Teleprinting Over Radio
RSA	Republic of South Africa
RTTY	Radio Teletype
S06	Russian numbers, male/female Russian, 5-figure grps
SITOR-A	Simplex Telex Over Radio, ARQ teleprinting mode
SITOR-B	Simplex Telex Over Radio, FEC teleprinting mode
Unid	Unidentified
US	United States
USCG	United States Coast Guard
UK	United Kingdom
V02a	"Atencion" Spanish numbers, 3-msg format
VOLMET	Formatted aviation weather broadcasts
XPA	Russian numbers in 20-tone audio code

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations have their ENIGMA (European Numbers Information Gathering and Monitoring Association) designators in ( ).

216.0 CLB-Non-Directional aero beacon (NDB), Carolina Beach, Wilmington NC, identifying in MCW at 0623. (Ron Perron-MD)

340.0 YY-NDB, Mont Joli, Quebec, Canada, MCW at 0553. (Perron-MD)

363.0 RNB-NDB, Millville, NJ, MCW at 0548. (Perron-MD)

366.0 YMW-NDB, Maniwaiki, Quebec, MCW at 0612. (Perron-MD)

371.0 FND-NDB, Ellicott City, MD, MCW at 0608. (Perron-MD)

391.0 DDP-NDB, Dorado, San Juan, Puerto Rico, MCW at 0543. (Perron-MD)

392.0 ML-NDB, Charlevoix, Quebec, MCW at 0635. (Perron-MD)

490.0 "E"-French Coast Guard, Corsen, SITOR-B Navtex at 0040. "G"-Monsanto Radio, Portugal, SITOR-B Navtex at 0100. "I"-Niton Radio, UK, Navtex at 2120. "L"-Hamburg Weather Office, Germany, Navtex at 2150. "T"-Niton Radio, UK, Navtex at 2310. (Ary Boender-Netherlands)

516.0 YWA-NDB, Petawa, Ontario, Canada, MCW at 0631. (Perron-MD)

2789.0 FUE-French Navy, Brest, RTTY test loop at 0219. (Tom Sevart-KS)

3137.0 44192-US Air Force KC-10A tanker, ALE-initiated direct dial patch call to Tanker Airlift Control Center, at 0020. (Mark Cleary-SC)

3450.0 "OK"-Pirate CW hobby beacon, possibly Oklahoma, at 0429. (Sevart-KS)

3476.0 Reach 8055-US Air Force Air Mobility Command (a C-17A), passing position to Gander Radio on North Atlantic air route net, at 0448. (Allan Stern-FL)

4149.0 WPE Jacksonville-Crowley Marine, FL, course and position checks with seagoing tugboats, working WBN 4382, Tug *Sea Horse*, at 0150. WPE, sending WBN 3012 and WBN 3016, Tug *Defender*, to 8294 for off-net traffic, at 0512. (Stern-FL)

4274.0 ZSC-Globe Wireless node, Cape Town, RSA, working a vessel in proprietary GW-Pactor, parallel 19692.5, at 1315. (Bob Hall-RSA)

4443.5.0 T1Z137-Possible US Army, working T1Z346 in ALE, at 0158. (Sevart-KS)

4477.0 040NHQCAP-US Civil Air Patrol headquarters, ALE sound at 0505. (Sevart-KS)

4479.0 Cuban Spanish AM numbers (V02a), callup 78103 38224 66088, then into messages, at 0500. (Sevart-KS)

4721.0 ADW-US Air Force, Andrews AFB, MD, calling 523573, a KC-135R tanker, ALE at 1350. (Cleary-SC)

4991.0 NF1-FBI, Norfolk, VA, calling NY1 (New York, NY), also 5058.5, ALE at 0604. (Cleary-SC)

5058.5 NK1-FBI, Newark, NJ, calling QT1 (Quantico, VA), also 7778.5, ALE at 0902. (Cleary-SC)

5097.0 CFH-Canadian Forces, Halifax, NS, RTTY NAWS (Notice to Allied War Ships) marker, at 0230. (Sevart-KS)

5450.0 Unid-UK Royal Air Force VOLMET, aviation weather at 0422. (Sevart-KS)

5544.0 SU0584-Russian Aeroflot flight 584, passing HFDL position to Bahrain ground station, at 1909. (Patrice Privat-France)

5696.0 CAMSLANT Chesapeake-USCG, VA, taking ops-normal message from helicopter Coast Guard 2124, at 1858. (Stern-FL)

5717.0 "4-Q-I"-US Navy, possible exercise net with various stations using trigraph calls, at 0700. (Sevart-KS) Rescue 313-Canadian Coast Guard CC-130, patch via Halifax Military to Halifax Search with position of distressed vessel, at 2342. (Cleary-SC)

5732.0 Spectre 22-US Air Force AC-130H gunship, calling Ops at 0507. (Sevart-KS) J12-USCG, raised TSC in ALE, then voice Coast Guard 6012 with a patch via US Customs Service Center to Clearwater Air, FL, at 1223. (Cleary-SC)

5881.5 R23626-US National Guard UH-60A, calling TKFMH (MA National Guard), ALE at 1015. (Cleary-SC)

5883.0 Cuban V02a in progress with 5-figure groups, AM at 0703. (Sevart-KS)

6330.5 FGA9361-Vessel *Clemabar*, calling Sailmail node Brugge, Belgium, in Pactor-1 at 2005. FGE9779-Vessel *Kea*, calling Sailmail Brugge in Pactor-1 at 2005. FS6634-Vessel *Neree*, calling Brugge, Pactor-1 at 2051. PG3306-Vessel *Drammer*, calling Brugge, Pactor-1 at 2130. (Boender-Netherlands)

6502.5 RUH981-US Army UH-60, calling WAROPS (1-228 AVN, Soto Cano, Honduras), ALE at 1159. (Cleary-SC)

6640.0 Delta 625-Flight calling New York, raised San Francisco instead, then given frequencies 3494, 6640, and 8933 for New York, at 0450. (Sevart-KS)

6679.0 Auckland VOLMET-New Zealand aviation weather for Pacific, at 0649. (Sevart-KS)

6697.0 Mincemeat-US military, EAM at 2242. (Cleary-SC)

6706.0 Trenton Military-Canadian Forces, working Canforce 2529, at 2207. (Cleary-SC)

6755.0 Russian Intelligence "Russian Lady" (S06), callup 471, preamble 283/5, message in Russian, AM at 0820. (Mike L-West Sussex, UK)

6761.0 Reach 8055-US Air Force Air Mobility Command, coordinating refueling track with KC-135 Ethyl 31, at 0051. (Cleary-SC)

6855.0 Cuban V02a, callup 75145 14718 02110, AM at 2101. (Cam Castillo-Panama) V02a, in progress in AM at 2127. (Sevart-KS)

6911.5 R23316-PA National Guard, calling KJSTNG, Johnstown-Columbia Airport, ALE at 0209. (Cleary-SC)

6985.0 R23548-SD National Guard UH-60A, calling TC189 (C/1-189 Aviation), ALE at 0204. (Cleary-SC)

7527.0 Coast Guard Rescue 34-USCG helicopter, telling CAMSLANT they have located an emergency beacon at Melbourne airport, FL, at 1337. (Cleary-SC)

7642.0 1QWAFA-US Air Force MARS, ALE sounding at 2341. (Cleary-SC)

7885.0 V02a in progress, using the new voice, AM at 2004. (Castillo-Panama)

7887.0 V02a, callup 70701 46065 65786 and into messages, AM at 2000. (Sevart-KS)

8009.0 Cuban "Cut Numbers" station (M08a), callup 68630 26126 77611, CW at 2302. (Castillo-Panama)

8097.0 M08a, MCW at 1806. (Sevart-KS) Cuban M08a, late start, MCW at 1809. (Castillo-Panama)

8140.0 Unid-Russian Intelligence "German Lady" (G06), callup 308, preamble 729/141, message in German, AM at 2012. (Mike L-UK)

8291.0 Echo-Unknown English speaker with a Hispanic accent, calling Aries and Lima at 2310. (Perron-MD)

8294.0 WBN-3012-Crowley Marine tugboat, working Tug *Defender*, came from 4149, at 0516. (Stern-FL)

8297.0 Vessel *Mary Grace*, voice and tone calls to 544, at 1210. (Perron-MD)

8337.6 Shark 07-USCG, calling helicopter Coast Guard 2105, at 1222. (Cleary-SC)

8396.0 VRBW8-Hong Kong bulk cargo vessel *Great Navigator*, SITOR-A message to TAH, Istanbul Radio, at 1630. (Privat-France)

8504.0 NMG-USCG, New Orleans, LA, FAX satellite image of Tropical Storm Erin and Hurricane Dean, at 2003. (Sevart-KS)

8776.0 Antidote-US military, calling Mainsail (any station this net) at 2146. (Cleary-SC)

8912.0 Juliet 03-USCG helicopter, patch via Service Center to E-City Air, Elizabeth City, FL, regarding rescue operations, at 2329. (Cleary-SC)

8971.0 Goldenhawk-US Navy, Brunswick Naval Air Station, ME, working Fighting Tiger 21, a P-3C, clear and secure at 1045. (Stern-FL) Trident 43, a P-3C, working Goldenhawk at 1201. (Cleary-SC)

8983.0 Coast Guard 2114-USCG helicopter, ops-normal report for CAMSLANT, VA, at 0001. CG 2134, departing for patrol, setting guard with CAMSLANT at 1326. CG 1712, C-130, ops-normal for CAMSLANT at 1437. CG 2113, telling CG 2102 their ops traffic has been passed to CAMSLANT, at 1630. "S-3-Q," position for CAMSLANT at 2232. (Cleary-SC) CAMSLANT, working helicopter Coast Guard 2120, at 1850. CAMSLANT, working Coast Guard Rescue 6E, at 1856. (Stern-FL)

8992.0 Teal 70-US Air Force Reserve 53rd Weather Recon "Hurricane Hunter" WC-130J, telling ground that Teal 71 will be up soon, at 0115. (Stern-FL) Evolution-US military, with three EAMs and "standing by for traffic," new Zulu day callsign of Race Track, at 0140. (Jeff Haverlah-TX) Offutt-US Air Force HF-GCS, Offutt AFB, NE, working Whiskey 820 (not heard), at 0355. (Karl Dahlquist-CA) King 85-US Air Force HC-130 rescue aircraft, patch via Offutt HF-GCS to King Ops, at 0433. (Sevart-KS) Reach 671, patches via Puerto and Lajes HF-GCS to Hilda (Scott AFB, IL), at 2302. (Cleary-SC)

9007.0 Canforce 3309-Canadian Forces CC-130, setting watch with Trenton Military, at 0123. (Cleary-SC)

9025.0 Coast Guard 1502-USCG HC-130, ALE-initiated patch to report that a vessel has been located, at 2012. (Cleary-SC)

9060.0 Unid-Russian Intelligence "English Lady" (E06), callup 857, preamble 304/129, message, AM at 1500. (Mike L-UK)

9110.0 NMF-USCG, Boston, North Atlantic ice chart FAX with a message that the ice season was over, at 1814. (Sevart-KS)

9265.0 CARMEN-Unknown station sounding in ALE, under WINB religious broadcast at 2244. (Sevart-KS)

9902.0 Unknown agency (E11), callup "186 oblique 00," at 1100. (Mike L-UK)

10416.0 Russian Intelligence "Polytone" (XPA), AM multi-tone callup 426 426 1, at 2000. (Mike L-UK)

10780.0 Cape Radio-US Department of Defense, Cape Canaveral Air Force Station, FL, testing for STS-118 (Space Shuttle) landing, at 1005. (Stern-FL) Canoe 03-US Air Force E-8 JSTARS, patch via Cape Radio to Peachtree, (Robins AFB, GA), at 1407. (Cleary-SC)

11120.0 Reach 8054-US Air Force, morale patch to Charleston, SC, on a discrete frequency with an unknown HF-GCS station, came from 11175, and yes, this is the right frequency (even the pilot wondered), at 2157. (Stern-FL) *[I believe it. This is an old Air Force discrete, last used for weather at Offutt, now apparently back in the pool. -Hugh]*

11175.0 Big Ranch-US military, new Zulu day callsign of Policeman *[See last month -Hugh]*, 3 EAMs at 0000. Sawtooth-US military, multiple EAMs at 2300. (Haverlah-TX) Claptrap-US Air Force, calling Mainsail, then test count at 0015. (Peter Murphy-USA) Shark 82-USCG, patch to Soto Cano Base Ops via Puerto Rico, at 0134. (Cleary-SC) Puerto Rico, patching "Hurricane Hunter" Teal 70 to ground regarding status of Hurricane Dean, at 2220. Puerto Rico, patching Teal 70 to National Hurricane Center for a full dropsonde report in Vortex format (due to satcom down), at 2320. (Stern-FL)

11205.0 Reach 554-US Air Force, working Smasher (US Joint Task Force, Key West, FL), at 2215. (Cleary-SC)

11220.0 Decurrent-US military, checking unknown data mode with Andrews, then back to 8776 for voice, at 1846. (Jack Metcalfe-KY) Mincemeat-US military, working Andrews at 1906. (Cleary-SC)

12223.0 Unid-Russian Intelligence "English Man" (E07), callup 201, preamble 324/119, message, bad AM audio and fading, repeated broadcast at 1720 on 11062 and 1740 at 10116, at 1700. (Mike L-UK)

11232.0 Chalice Foxtrot-US Air Force E-3 AWACS, patch via Trenton to Radar Maintenance, at 2005. (Cleary-SC)

12353.0 Tug *Defender*-Crowley Marine, working WPE Jacksonville, FL, at 1711. (Cleary-SC)

12575.3 235051998-Maritime Mobile Service Identity of UK Carnival/P&O cruise ship *Ocean Village II* (voice MPRZ), calling Lyngby Radio in DSC, at 1547. (Privat-France)

12631.0 KSM-Maritime Radio Historical Society, Pt. Reyes, CA, weekly RTTY test with tropical storm Henriette advisory, RTTY at 2142. (Hugh Stegman-CA)

13927.0 AFA4DD-US Air Force MARS, TX, patching Evac 60410, C-130 medical mission, to coordinator, at 1709. Hobby 29-US Air Force WC-130J, ferrying to remote home plate for hurricane recon, MARS patch to St. Croix for Hurricane Hunter Ops, at 2027. (Stern-FL)

14325.0 W6LMJ-Amateur in Hurricane Watch Net, West Palm Beach, FL, discussing a station in Jamaica during Hurricane Dean, at 2140. Hurricane Watch Net control passing alternate frequencies of 7268 and 3950 (both LSB), at 2306. (Stern-FL) KA5E-Hurricane Watch Net, passing advisories and observations of Hurricane Felix, at 2200. (Stegman-CA)

14606.0 AFA1WP-US Air Force MARS, MA, patching Dawg 01 to Jacksonville Naval Air Station, at 1536. (Stern-FL)

15016.0 Syllabus-US military, new Zulu day callsign of Sawtooth, with three EAMs, also on 11175, at 0000. (Haverlah-TX)

16540.0 Unid-Male working Paricoy, Manila, Philippines, in English and Tagalog, at 1155. Alpha 6, calling Bravo 62, no joy at 2345. (Perron-MD)

17435.0 Cuban V02a, AM callup 26135 52376 77850, old voice at 1701 and new voice on a different day at 1736. (Castillo-Panama)

17436.0 Cuban V02a, AM callup 28117 58276 34866 and into messages, at 1700. (Sevart-KS)

17478.0 Cuban V02a, AM callup 02861 06823 30230 and into messages, at 1600. (Sevart-KS)

17480.0 Cuban V02a in progress, new voice, AM at 1605 and 1615. (Castillo-Panama)

18864.0 Unid-UK "Cherry Ripe" (E03a), tune and callup 52503, at 1100. (Mike L-UK)

19036.5 7RQ20-Possible Algerian MFA, Coquelet-8 traffic at 1335. (Hall-RSA)

DIGITAL DIGEST
DIGITAL MODES ON HF

Mike Chace
mikechace@monitoringtimes.com
www.chace-ortiz.org/umc

The Codan 16 Tone Modem

This month we take a look at a popular high-speed modem whose decoding is finally in the realm of possibility for the consumer with high-end decoders like the Hoka Code300-32. One of the most widespread users of the modem is the Egyptian Diplomatic Service who appears to have been steadily migrating most embassies from their ancient SITOR-A technology for a number of years now. We'll show you where you can tune to find these signals.

❖ The Codan 16 Tone HF Modems

A commercial unit from Codan of Australia, the 9001/9002 and 3012 16 Tone modem is currently used in Africa, Asia, Australia, Europe and the middle East by the United Nations, various aid agencies, non-governmental organizations, ministries of the interior, and public authorities. The modems are usually connected to PCs for sending files, faxes and other data.

Codan supplies a software suite to facilitate this, the imaginatively named "9102" program, which operates in the background and requires no operator intervention to do its work. You can see a picture of the typical base station configuration below.

3012 HF Data Modem, NCF desk console, NCF RF Unit and computer

The modem uses 16 tones QPSK modulated running at a symbol rate of 75bd each, thus enabling a raw data rate of 2400 bps. In practice this gives about 1500bps throughput uncompressed or up to 6000bps with compression. The tones range from +656.25Hz to +2343.75Hz with a tone shift of 112.5Hz. The modem is fully automatic and supports both data compression and selective calling (selcal). See Resources for an audio clip of the modem in action. It is fairly easy to tell apart from other modems.

Many Codan radio plus modem installations are also outfitted with regular MIL-STD-188-141A ALE controllers and are therefore able to interoperate with networks using that link control standard. You'll see in the notes below that many networks using Codan radios and high-speed modems also use 141A ALE. In most cases, the same identifiers are used for both Codan and 141A ALE.

❖ The Codan Chirp

Codan's CALM (Codan Automated Link Management) scheme is driven by a so-called chirp, used for selective calling, link setup and quality monitoring. The chirp itself is a raspy sounding burst that's quite distinctive (see Resources for the audio clip). The chirp uses a low data rate of 80bd BPSK with 30 tones spaced at 81Hz and occupies the full bandwidth of the receiver, making it very robust against interference and fading.

Unlike regular 141A ALE, Codan chirp is also used to transmit frequency measurement information, helping to ensure that both receiver and transmitter are accurately aligned. This is done after link setup and before any high-speed data is sent.

❖ Codan Networks

Here are some networks currently employing the 9001/9002 and 3012 modem equipment that you can listen out for.

Egyptian Diplomatic Service

This is probably the most widely heard of the Codan networks. Most embassies, including those in some far-flung places, appear to be capable of using the Codan modem. However, old habits die hard, and there is still a lot of traffic using the old SITOR-A gear.

As is often the case with transition to new modems, the same operating style and frequencies are carried over from the old system. Codan chirp is used to set up links, with five figure selcals employed. These numerical selcals are simple translations of the old four letter SITOR selcals. For example, Havana (IPTX in SITOR) is addressed in the Codan system as 55501. You can use Ralf Kloth's handy on-line tool to help you with these translations (see Resources).

Codan 9002/3012 traffic appears to be encrypted and much monitoring of the Washington and Havana links has yet to yield any recognizable traffic. Only SITOR-A/B selcals and Codan chirp are used for call-ups. There is no 141A ALE.

Frequencies (kHz USB) and Links:

6758	Cairo-Paris
7777	Cairo-Riyadh
7797	Cairo-Paris
7825	Cairo-London
7960	Cairo-Madrid
8083	Khartoum-Cairo
9055	Cairo-Havana
9057	Cairo-Berlin
9066	Havana-Cairo
9150	Cairo-Madrid
9315	Madrid-Cairo
11033	
11050	Cairo-Paris
11055	
12220	
14428	Cairo-Vienna
14444	Cairo-Kinshasa
14522	
14529	Cairo-Nairobi
14628	Berlin-Cairo
14683	Cairo-London
14918	Cairo-Algiers
14922	
14925	Cairo-Prague
16023	Cairo-Rome
16180	Washington-Cairo
16212	
16235	Cairo-Moscow
16340	Cairo-UNID African Embassy
18251	
18315	Cairo-Islamabad
18325	Cairo-Washington
20075	Rabat-Cairo

Moroccan MOI Network

This large and active network uses Codan radios with both chirp and regular 141A ALE. It is believed to be operated by a Ministries of the Interior (MOI) department, possibly Civil Defense. You can hear the stations on voice after link ups but there doesn't seem to be any data activity.

The net control stations (NCS), probably located in Rabat, are usually one of "2001", "2011" or "1001" depending on frequency used. Outstations use identifiers like "2513". There is also a sub-network of 5 digit identifiers beginning with 13. The NCS in this case is "13011".

Frequencies (USB):
3155 3558 3805 4855 5792 5435 5823 6500 6792 6921 8020 8600 9070 9200 10390 10900 11390 11500 13499 16240 17435 18765 25120kHz

Greek Network

Best guess on this Codan-based network is that this is operated by the Greek Police police. As another example of the numerically formatted ALE identifiers that form various

Glenn Hauser
P.O. Box 1684-MT, Enid, OK 73702
glennhauser@monitoringtimes.com
www.worldofradio.com

Monitoring 190 kHz of Spectrum at a Time

Brandon Jordan in Memphis, TN, has been using the RFSpace SDR-14 to record everything in a 190-kHz segment of the 60-meter band (or any other) over an entire overnight period, 8 hours or more. Once this is done, he can go back and study exactly when carriers come on and go off, or fade in and out, and pick out the best times to listen to the modulation. This also reveals a lot about operation and propagation. A selection of such logs from mid-August appears below under BOLIVIA, BRAZIL, ERITREA, GABON, MADAGASCAR, MALI, MAURITANIA, MÉXICO, NIGERIA, PERÚ, SOLOMON ISLANDS.

But doesn't this also consume hours and hours of study after each recorded session? Brandon explains, "Many European DXers are embracing these wide-band recordings, more so than North Americans, and primarily on MW. Yes, it can be time consuming, depending on how thoroughly one goes through the recordings. Fortunately, the SpectraVue software allows for very efficient operation in both the time and frequency domain, and it only takes a few seconds to fast-forward or reverse to any frequency and time in the recording session with nothing but mouse clicks. It takes but a few moments to find an interesting signal, determine the likely target(s), the sunrise/sunset at transmitter(s) and fast-forward to the enhancement period(s).

"I personally am ramping up for employing this method to its full extent for the upcoming DX season, especially for DXpedition usage. The visual component also speeds up the process tremendously. It is more time-consuming to fully exhaust all signals in a recording session, but much more efficient in the long run than sitting at a receiver all night, DXing one frequency/signal at a time. There is no real hit-and-miss here, and you don't waste any time sitting on an unproductive signal.

"This method really shines in making the best of DXpedition situations. A few of these SDRs and a weekend's DXpedition can provide a month's worth of outstanding recordings to dig through at one's convenience." More about this at **http://bcdx.org**

ALBANIA R. Tirana B-07 **English**:
　　1500-1530 ENAm 13640
　　1945-2000 Eu 6135, WEu 7465
　　2100-2130 WEu 7430, ENAm 9915
　　0245-0300 & 0330-0400 ENAm 6110 7425
　　Albanian:
　　0730-1000 Eu 7105
　　2130-2300 Eu 6005, WEu 7130
　　0000-0130 ENAm 6110 7425
　　All 100 kW from Shijak, 310 degrees except 6110 = 300 degrees, and Eu = non-directional (R. Tirana)

ALGERIA [non] Once Chad [*q.v.*] had finally left the 7260 area, we heard another not so distorted signal in Arabic, at 0550-0559* which was RTA relayed via UK (gh, OK)

BELARUS [non] 6120, R. Racja via Warsaw, *2201-2231*, IS and ID, talks between lite musical selections. ID in passing at 2226 (Scott R. Barbour Jr., NH, *DX LISTENING DIGEST*) B-07 maybe 2100-2200

BHUTAN BBS, www.bbs.com.bt/RadioSchedule.html converted to UT, shows English at 05-08, 09-10 and 14-15 on new 100 kW 6035. Only 1400 at night has the remotest chance of making it to NAm (gh)

BIAFRA [non] V. of Biafra International quit their broadcast via RSA 7380, Sat 2100-2200, not reported since May. But in late August, Bernie O'Shea in Ottawa and I found its replacement: Fridays only, 2000-2100 via WHRI 15665. This clandestine from K Street in Washington DC is partly in English, very good here except for long-path echo; still promoting independence from corrupt Nigeria. WHR online schedule showed wrong frequency 17650, and a second VOBI broadcast, Wed 1915-1945 via WHRA 13710 which failed to materialize. Announcements and website **www.biafraland.com/vobi.htm** also give wrong frequency, "15.67 MHz"; audio files available (gh, OK)

BOLIVIA Radio Virgen de los Remedios, Tupiza, at 1127 on 4550, good quality with ID for FM 89.5 and SW (Adan Mur, Paraguay, *Conexión Digital*) Previously reported on 4545.4, 3214.9, 5905, maybe 3451 (gh)

R. San Miguel, Riberalta, Beni, on new 4699.4 at 1028 in Spanish, notices and messages, ID (Rogildo F. Aragão, Bolivia, *DXLD*) Tentatively this also on 4699.40 at 0115-0208*, talk and music, improved by sign off but no ID heard (Brian Alexander, PA, *ibid.*) 4699.41, from 0930 flute music and talk, 1001-1008 ad block, tentative ID, 1015 Indian language, 1020 fading (Dave Valko, PA, *HCDX*)

R. Logos, Santa Cruz, 4865.01v, presumed, here during the entire recording from 0254 to 1200, drifting +/- 25 Hz, only peaking to audio levels after 1000 and best from 1020 to 1040, matching 1026 UT Santa Cruz sunrise. Religious sounding vocals, no announcements heard, and unable to determine language. Very poor due to beeping ute QRM on both sidebands. Carrier faded into noise floor shortly after 1200 (Brandon Jordan, TN, *DXLD*) See also 6165 below

R. Estambul, Guayaramerín, Beni on new 4875, ex-4498.1 at 0207, *Show de los sábados*, 0312 ID, sign-off (Rogildo F. Aragão, Quillacollo, Bolivia, *DXLD*) What became of R. La Cruz del Sur on 4875?

(gh) I was looking for that when I was surprised by Estambul (Aragão, *ibid.*) Tentatively Estambul on new 4875.08 from *0955, audio peaking at threshold 1029-1035, fitting sunrise enhancement (Brandon Jordan, TN, *ibid.*) Only heard twice in the morning, with religious program in Portuguese at 1045 (Aragão, *ibid.*) So don't take for Brasil (gh)

Radio San José, San José de Chiquitos, 5580.36, rosary at 2335-2339 (Arnaldo Slaen, Argentina, *DXLD*)

Radio Santa Cruz, 6134.83 at 1035-1040, with several critics of Evo Morales government (Arnaldo Slaen, Argentina, *DXLD*) Santa Cruz is a hotbed of opposition to Morales, inhabited by blue-eyed European immigrants, per a KUNM documentary (gh)

Radio Logos, 6165, at 1050 with religious talk, strong Bonaire QRM from *1058 (Arnaldo Slaen, Argentina, *DXLD*) Another day after Bonaire closed, audible at 1157 with ID, then off (Nicolás Eramo, *ibid.*)

BRAZIL Gleanings from overnight 190 kHz RFSpace SDR-14 recordings:

R. Congonhas, presumed, switched on at *0759 and measured on 4775.02. Only threshold audio at best around 0936 "sunrise at transmitter" enhancement, at which time transmitter had settled on 4775.04 kHz.

4785.07, R. Caiari, Porto Velho RO, presumed, switched on at *0844, but no audio heard until beginning around 1020, Portuguese talk with audio slightly improving, fading back down by 1028.

4805.00, R. Dif. do Amazonas, Manáus, switched on at 0932 and transmission started at *0955 with sign-on announcements. Great signal but not a match for CODAR.

4845.23, [R. Cultura] Ondas Tropicais, Manáus, switched on at 1002, strong S9 carrier with 1004 "sunrise at transmitter" enhancement. Signal levels still good when programming began at 1031 sign-on but ute QRM; into contemporary vocals, no announcements until 1100 by which time audio had faded to unusable levels.

4914.96, R. Difusora, Macapá AC, 0230-1120, noted here all night with music format, fair signal amidst heavy CODAR until Goiânia sign-on and fading down after Macapá sunrise. Disappeared below noise floor by 1120.

4925.03, R. Educação Rural, Tefé AM, Aug 15, presumed, switched on at *1019 with announcements, massive CODAR QRM here (Brandon Jordan, Memphis, TN, *DXLD*)

Rádio Cultura AM, de São Paulo, instead of nominal 9615, heard between 9350 and 9355 at 1803; again two weeks later at 1715; off-frequency for almost a month (Célio Romais, Porto Alegre (RS), Brasil, *radioescutas yg*) At 2306 on 9353 ID, time check, traditional vocal music and show about our Portuguese language; good modulation but some fading (Adan Mur, Paraguay, *Conexión Digital*)

Its MW transmitter on 1200 has been moved to a new site, Guarapiranga, and the SW on 6170, 9615, 17815 will also be moved there, with power reduced from 7.5 to 1.5 kW, according to station engineer Sr. Sebastião (Luiz Chaine Neto, SP, *radioescutas yg*)

CANADA CKZU & CKZN 6160 get more QRM: see ECUADOR

CENTRAL AFRICAN REPUBLIC Dear Mr Mbami, I heard about Radio ICDI some months ago being on the air. However, I have seen no recent reports

of it. Could you please confirm whether or not Radio ICDI has been or is currently on the air on 6030 kHz, or another frequency? And at what hours? Thanks (gh to Josue Mbami, Radio ICDI, via *DXLD*)

Dear Glenn, Yes, I confirm this information about Radio ICDI. We work on 6030 at 0500-0800 & 1600-1900 UT. Radio ICDI uses now French, Sango, Fufulde, Bayaka languages. We are looking for financial aids to support our workers because we need to add supplementary hours to the old ones. CAR population appreciate very much Radio ICDI program and all country hears our radio now. Thanks, (Josue Mbami, Radio ICDI, Coordinator, Central African Republic, *WORLD OF RADIO*)

So our best (only) chance to hear Boali in NAm remains at *0500 UT Mondays, when Cuban jamming and Martí are in truce, but then CFVP and who knows what else are the obstacles. Of course that is close to local sunrise in CAR, so the window won't last long, and being almost equatorial, varies little during the year (gh)

I realize it is not your mission to be heard anywhere outside the CAR, but I am very curious to know if you are aware of any credible reception reports from other continents, or even other parts of Africa? At one point 7160 was mentioned as an alternate frequency. Was this ever used or do you plan to use anything but 6030? (Glenn Hauser to Jim Hocking, *ibid.*)

We have been heard in Congo Brazzaville, DR Congo, across the border in Cameroon and some in Chad. We know that we are in Sudan a ways but not sure how far. No, not yet on 7160 as we need to purchase another transmitter for $7000.00 Always looking for funding – smile (Jim Hocking, Indiana, Director ICDI, *DXLD*)

6030, Calgary, CFVP relaying CKMX (AM 1060), 0458-0509; could not detect anything of the *0500 of Radio ICDI (Ron Howard, CA, *ibid.*)

CHAD The extremely distorted signal from RNT, reported last month around 7260v, finally disappeared in mid-August (gh, OK) Seems back to proper 6165, audible under Croatia after 1800 (Jari Savolainen, Finland, *DXLD*) Heard French under Croatia after 2200, and Chadian anthem played at 2228 sign-off (Mauno Ritola, Finland, Carlos Gonçalves, Portugal, *ibid.*) 6165 blocked here by Bonaire until 0600, then something audible (gh, OK)

CHINA In reply to R. Free Asia's request last month [under USA] for info about jamming sites:

China jams Chinese/Tibetan/etc. programs of Sound of Hope, VOA, RFA, BBC, AIR and so on. There are two types of jamming; "Firedrake" (musical jamming) and CNR-1. They use both Firedrake and CNR-1 to jam the in-band broadcast, while only Firedrake is used to jam off-band programs such as SOH. Based on monitoring by NDXC members and directional analysis, jamming comes from multiple sites – there is no site used for jamming only. Thanks to mis-transmission and directional analysis, we found that some transmitters in Hainan, Xi'an, Qiqihar and Kunming are used for jamming.

The jamming is controlled by Radio Control Bureau of SARFT – The State Administration of Radio, Film and Television, and the jamming is monitored by Radio/TV monitoring stations – one of these, #573, is north of Beijing. It is reported that Radio/TV monitoring stations are also located in Shanghai, Xinjiang, Hainan and Heilongjiang. Details of monitoring stations are unknown since official documents do not mention them. It has long been believed that jamming was controlled by army and/or Communist Party. Thus it is quite interesting that jamming is controlled by "underground" organization SARFT (Nagoya DX Circle, translated by S. Wakisaka, via Sei-ichi Hasegawa, *DXLD*)

Firedrake satellite feed located, ChinaSat 6B on half of a stereo pair with a mono service on the other side. See article on my website **www.sat-directory.com/firedrake.html** which also has an audio sample, and a full 60-minute CD is available (Mark Fahey, Sydney, Australia, *DXLD*) Illustrated with some wonderful socialist-realism (gh)

CUBA It's always something at RHC. This time we report 13680 out of whack, somewhat distorted plus extremely distorted spurs at 1320 on one occasion, around 13771, 13728, 13634, 13589, 13540. Another one matching 13540 was probably on 13820 but squashed by the jammers against R. Martí. A couple weeks later, RHC added a new intentional frequency, 13760, which also produced a leapfrog mix on 13720 at 1345-1500 while the CRI relay 13740 was also on the air. 13760 also heard at 2130 without any other RHC frequencies on that band. In the morning, 13760 and 13680 were slightly unsynchronized, thus from separate sites. Main other user of 13760 during these hours is V. of Korea: Communists jamming each other! (gh, *WORLD OF RADIO*)

DOMINICAN REPUBLIC Heard for first time in over two years, R. Amanecer Internacional, 6025.08 in late August, 0240-0401* religious programming, suddenly off without sign-off; another night off abruptly at 0444* (Ron Howard, CA, *DXLD*) On a few occasions still on the air past 0600, lite gospel music and health features in Spanish; squeezed between China 6020 relay until 0600, and Cuban jamming and Martí on 6030. A pity DR's only active SW station is right next to that (gh, OK) I can hear it all day when this is not a problem (Terry Krueger, FL, *ibid.*) Also at 2350 but worse splatter after 2358 (Brian Alexander, PA, *ibid.*)

ECUADOR HCJB Portuguese to Brazil at 0900-1030 on 6160 ex-9745 for B-07; transitionally on both in Sept (Eunice Carbajal, HCJB, via Leonaldo Ferreira da Silva, *radioescutas* yg) Tough luck, CKZN/CKZU, which aren't registered with HFCC, so the big guys can blow them away with 100 kW as if they don't exist (gh)

A circular from HCJB's German section, issued Aug 30, says they hope to continue transmissions from Pifo to Europe some more months beyond planned deadline of the end of September, for dismantling the last remaining antenna for Europe, because construction of new Quito airport will be delayed by several months (Kai Ludwig, Germany, *DXLD*)

ERITREA [and non] Mystery station on 7175 at 1600 with nonstop Arab vocals by same singer without any announcement until 1645*, co-channel V. of Broad Masses of Eritrea (Martien Groot, Netherlands, *DXLD*) UAE registered with unknown program (Noel Green, UK, *ibid.*) Nothing heard here at 1600-1630 (Wolfgang Büschel, Germany, *ibid.*) Definitely there again from *1557, same singer from 1600; from 1647 Iran carrier is on. Another day played Mariah Carey(?) instead (Martien Groot, *ibid.*) So unID singing is probably to jam Eritrea? (gh) Arabic singer then heard another day at 1600-1640, from Ethiopia? (Büschel, *ibid.*) Then on August 23, VOBME on 7180 instead at 1600, to avoid jamming (Martien Groot, *ibid.*) In the morning, VOBME still on 7174.98 at *0353-0503* joined by non-stop Horn of Africa vocals on 7175.00 from 0353 after carrier-on at *0343, off at 0503* (Brandon Jordan, TN, *ibid.*)

GABON 4777.00, R Gabon, Moyabi, 0456 transmitter switched on, 0459 French programming, 0501-0511 news, many IDs. Initial noisy S7 signal rapidly improved to very good S9+10 by 0509 sunrise at transmitter and lasting until 0523 before slowly starting to fade. Carrier did not drop below noise floor until 0757 (Brandon Jordan, TN, RFSpace SDR-14 recordings, *DXLD*)

GERMANY Re last month's item: Deutschlandradio management decided not to spend the 100 kiloeuro needed to repair the Berlin 6005 transmitter (Kai Ludwig, *DXLD*) After 56 years in steady 24 hour service, Britz SW site, former RIAS Berlin till Dec 1993, has ceased forever (Wolfgang Büschel, Germany, *ibid.*)

INDONESIA V. of Indonesia in English could be heard on 11785 at 0200-0300, but only just! (Barry Hartley, Queensland, *BC-DX*) English to Europe at 2000 doing well on 11785, not on announced 15150 // 9525 (Raúl Saavedra, Costa Rica, *DXLD*) Language schedule was all mixed up on Sept. 12 following the quake (A. Ishida, Japan, NDXC) Jarred their clock, automation into mis-alignment? (gh)

JAPAN NHK World, R. Japan, **English** reduced as of Oct. 1 to:
0000-0020
   SEAs 17810 & 13650, Eu 5960-UK, ENAm 6145-C
0500-0530
   SEAs 17810, SWAs 15325, SAf 9725-G, Eu 5975-UK, WNAm 6110-C
0900-0930
   SEAs 11815, SWAs 15590, Oc 11890, Haw 9825
1200-1230
   SEAs 13660, Oc 9625, Eu 17600-UAE, ENAm 6120-C
1310-1340
   SWAs 11985 [*sic,* odd time, not clear why]
1400-1430
   SEAs 7200, SWAs 11985, CAf 17580-A, Eu 13630-UK, ENAm 11705-C
2200-2220
   Oc 13640
   A=Ascension, C=Canada, G=Gabon, UK=UK, UAE=UAE; others Japan direct.

Note that English *does* continue to Europe and North America, although contracted to 30 or even 20 minutes, no more 60s. Will this leave any time for feature programming, or just news and news-related? So in NAm, we still have Canadian relays at 05, 12 and 00 UT, fairly convenient times, and add 14 on 11705, which had been only in Japanese. A big improvement in our mornings. No changes in the Sackville relays are expected for B-07, and staying at the same UT after we are off DST. Many but not all of the other frequencies will stay after Oct 28 (gh, from NHK website)

KURDISTAN R. V. of Kurdistan, Northern Iraq, 0250-0335 fade-out, martial songs, political talks, starting on 3930, then jammed from 0255, and quickly changing to 3940, 3926, 3930, 3920 and the jammer followed quickly after! (Anker Petersen, Denmark, @tividade DX)

LAOS [non] Despite what the Hmong Lao Radio office in Minnesota told me in last month's column that HLR was off SW for good, it came back in mid-August, as before Sat & Sun 1300-1400 on WHRI 11785. From Sept, another Hmong program was added at 1400-1500, Hmong World Christian Radio. This one is also worth listening to for the exotic, rustic music. Probably one UT hour later after DST (gh)

LIBERIA 5470, R. Veritas, fair from 2042, 80's pop ballads with brief affirmations over music. Several IDs as 'R. Veritas – Your friendly station'. Local timecheck, 'Good night to our SW friends' and frequency at sign-off, music cut off at 2100* (Scott R. Barbour, Jr., NH, *DXLD*)

LIBYA [and non] TDF's DRM tests via Guiana French on 17870-17880 continue to be scheduled M-F at 13-20, but were missing most of August, and sporadically thereafter. On such occasions, and weekends, it was possible to hear V. of Africa's English broadcast at 14-16 on 17870, stronger than // 17725. These broadcasts were not registered with HFCC (gh, OK) From Sept 2, 17725 changed to 21695, sometimes audible with readings from the *Green Book* (Brian Alexander, PA, *DXLD*)

MADAGASCAR R. Malagasy, presumed, at 0350 easy going island sounding vocals, 0400 announcement. Mainly poor, transmitter steadily drifting from 5010.79 at tune-in, down to 5010.72 by 0500. Stayed on past listed 0500* (Brandon Jordan, TN, *DXLD*) Another day, on early at 0245, jazz-like music, mentions Malagasy and Madagascar (Scott R. Barbour, Jr., NH, *ibid.*)

MALAYSIA 15295, VOM, 1203-1230*, Mandarin including tentative English ID at 1210, barely audible at sign-off (Scott R. Barbour, Jr., NH, *DXLD*) So not only in middle of night is this audible (gh)

MALI ORTM, Bamako, switched on 4835.58 at 0537 with S5 signal. Hints of threshold audio appearing around 0610 and signal peaking to S7-8 levels with 0620 "sunrise at transmitter" enhancement lasting only about 10 minutes.

A very nice extended ethnic vocal featuring a female singing over stringed instruments before audio rapidly faded to unusable levels. Still above noise floor at 0800*.

5995.0 from *0556 until blocked by Australia from *0758. Terrible slop from Cuba 6000 until 0632. Much improved by 0658 with stringed instruments until 0702 French ID, news (Brandon Jordan, TN, RFSpace SDR-14 overnight recordings, *DXLD*)

MAURITANIA R. Mauritanie, switched on at *0703 with news in progress in French, too late for 0646 "sunrise at transmitter" enhancement in mid-August. Good modulation, so audio was at decent levels despite noise, and transmitter drifted downward from 4845.19 while warming up until settling at 4845.15 by 0715 (Brandon Jordan, TN, *DXLD*)

MÉXICO XERTA, Mexico City, 4810.00, Aug 15. Same new age synthesized tune played over and over from 0900 until SDR-14 recording ended at 1200. No announcements at all, just this boring tune non-stop (Brandon Jordan, TN, *DXLD*) Missing on Sept 9 (gh) Station said they would be off for 30-60 days to replace antenna (XE1RCS bulletin via Thierry Fricot, DF, *DXLD*)

MYANMAR I am convinced it is Myanma R., Yangon, I can hear on 7185, from 0031 with distinctive intro on indigenous instrument, 0033 Buddhist prayer/recitation, 0041 gong. Carrier already appeared as early as 2354. Surprisingly, exactly on frequency, but QRM from NAm hams. No ID as such but can't be anything else (Martien Groot, Netherlands, *DXLD, DSWCI DX Window*) Also at *0030-0045, plus weaker station on 7185 (Anker Petersen, Denmark, @*tividade DX*) Challenging but possible in NAm with grayline; hams please QRX at this hour (gh)

NIGER LV du Sahel, Niamey, 9704.99, 2235-2300*, French talk and ballads. 2253-2258 Kor'an. Distinctive fanfare followed by choral anthem at 2259. 2300 short test tone and off. Poor to fair. On Sundays sign-off is at 2200* (Brian Alexander, PA, *DXLD*)

NIGERIA R. Nigeria, Kaduna, 4769.97, switched on at 0416, but only threshold audio detectable by 0428 due to poor modulation despite S6 to S7 signal. Signal suddenly rising to S8-9 with improved audio exactly at 0513 "sunrise at transmitter" enhancement lasting until 0523 before beginning to deteriorate, with news type monologue by male in presumed Hausa. Audio back to barely threshold levels by 0540 and carrier finally dropped below noise floor at 0730 (Brandon Jordan, TN, RFSpace SDR-14, *DXLD*)

PAKISTAN R. Pakistan, tentative B-07 English: 0730-0830 17835, 15100; 1600-1615 15725, 15105, 11895, 11570, 9380, 9365. Also Assami service is partly in English around 0100-0115, on 9350 or 7445 (gh) PBC QSLed English at 0100 in August, then on 9340 (Mukeh Kumar, Bihar, *DXLD*)

PAPUA NEW GUINEA Another station reactivated since last month's report: R. West New Britain, 3235 at 1130 to 1400* (S. Hasegawa, Japan, NDXC) Then heard here from 1045, 1100 children's choir, then fading (Dave Valko, PA, *HCDX*) In late Aug from nearby northern Queensland, these were heard between 0900-1300 UT: 3205, 3235, 3260, 3315, 3325, 3335, 3365, and 3905 kHz. Port Moresby on 3290, 4890 & 9765 not heard at any time. Wantok Radio Light I heard on new 7325 a few times but very weak, only just audible, same for Catholic 4960 station; could just make it out at night (Barry Hartley, *BC-DX*)

PERÚ Some SW stations audible following the earthquake: R. Melodía 5940, R. Universal 6090, R. Quillabamba 5025, R. Tarma, 4775; but not R. Unión 6115 (Alfredo Cañote, Perú, *condiglist* yg)

R. Tarma, presumed, turned on at 0953 and measured at 4774.98. No audio noted until almost 1100 and barely improving to threshold audio by 1115-1118 despite greyline between Tarma and Memphis, at which time had stabilized around 4774.96.

R. Melodía, Arequipa, was present during entire recording 0332-1157 UT Aug 16, drifting back and forth between 5939.27 and 5939.29. Improved close to 1103 sunrise at transmitter with huayños and indigenous music. Began fading not along after 1120 Memphis sunrise. Poor.

R. Huanta 2000, Huanta, signing on at *0913 on 4755.01, but dominated by Campo Grande, Brazil. Drifted downwards until finally settling on 4754.97 around 1035. Checked back at 1054 "sunrise at transmitter" enhancement and all alone with many mentions of Huanta and lots of sound effects (Brandon Jordan, Memphis, TN, overnight 190 kHz RFSpace SDR-14 recordings, DXLD)

Contrary to expectations last month, the Peruvian back on 4790 is not R. Atlántida, but: Radio Visión, Chiclayo, 4790.2, reactivated in late Aug after several months inactive, at 0530-0550, hymns, La Voz de la Salvación program, best on LSB (Manuel Méndez, Spain, *DXLD*) And then widely reported: 0220-0315 organ song, IDs, preaching, CODAR and digital QRM (Mark Taylor, WI, *ibid.*) Good at 0439 (Maurits Van Driessche, Belgium, Benelux DX Club) Then down to 4790.15, strong in Denmark 0350-0445 including 0405-0435 *"Gloria, Gloria... Aleluya"* all the time! 0436 complete ID, slight CODAR QRM. Strongest Peruvian here for months! (Anker Petersen, *DXLD*) Apparently all-night: 4790.16, 0836-0851, continuous instrumental music and occasional voice-overs with vox effects making copy difficult, 0846 ID (Scott R. Barbour Jr., NH, *ibid.*) Audible most nights with religion in 0500-0600 period, always with CODAR swishing (gh, OK) 4790.2, 0600 dramatization of Bible story of 7,000 demons, a herd of pigs and a cliff in the vicinity of the town of Cana (Dan Sheedy, CA, *ibid.*)

R. Victoria, Lima, reactivated on 9720 after two months, late August at 0620 // usual 6019.6 with La Voz de la Liberación gospel program (Manuel

Méndez, Spain, *ibid.*) That preacher speaks Portuñol (Españgués?), mixture of Portuguese and Spanish (gh) 6019.49 at 0745-0800+ // very weak 9720.04 (Brian Alexander, PA, *ibid.*)

RUSSIA Russian army station R. Zvezda [Star] heard around 1700 on 8886. I believe this is 9615 minus 729 mix from transmitters at Samara; could also be on + 729 = 10344; previously had similar mix on 6561 and 8016, +/- 729 kHz from 7290 (Jari Savolainen, Finland, *DXLD*)

SAINT HELENA To celebrate R. Saint Helena 40 years, a new R. St. Helena Day will take place in December 2007! More on this later! From **www.sthelena.se/radioproject/latest.htm** (gh)

SOLOMON ISLANDS SIBC Honiara, 5019.85, back on the air from Sept, heard at 1246, weak but readable, presumably relaying BBC (Volodya Salmaniw, BC, *DXLD*) Set up overnight SDR-14 recording of this: 5019.86 carrier rising above noise floor at 0627, about an hour before SIBC sunrise, and well above noise floor by 0718 sunrise at transmitter. Peaking 0830-1030 with bits and pieces of threshold audio in presumed Pidgin or extremely accented English. Faded somewhat until peaking again at 1130 UT Memphis sunrise; carrier finally disappeared into noise floor at 1320, at which time it had drifted upward approx. 10 Hz to 5019.87. Cuba 5025 was playing music most of the time the signal was peaking, which causes major slop here (Brandon Jordan, TN, *DXLD*) 5019.85, SIBC, from 1907, very poor signal and audio in English news (Maurits Van Driessche, Belgium, *BDX*) Heard "Radio Hapi Isles" (an oxymoron if ever there was one!) for the first time in many weeks on 25 August around 0715, much weaker than previously and I feel it is on lower power (Barry Hartley, NZ, *BC-DX*)

TIBET Xizang PBS, Lhasa, are happy to receive a few dozen reception reports a month. Address is definitely 41 Beijing Middle Road in Lhasa, not no. 180 as reported before by some sources. English program *"Holy Tibet"* reaches many Asian and African countries, as well as the US, Canada, Australia, Finland and Germany (Maarten Van Delft, Netherlands, DSWCI **DX Window**)

TURKEY Italian service of Voice of Turkey was missing for 2-3 weeks in Aug, still in Sept, just music and multilanguage IDs every day at 1630-1700 on 9610. Italradio portal then explained it was temporary due to lack of staff (Roberto Scalgione, Sicily, *DXLD* and *bclnews.it* yg) English at 0310 had two separate newscasts on 7270.00 and 5975.02, unlike previously (Liz Cameron, MI, *DXLD*) Different feeds to Asia, NAm, on different local days of week? (gh)

UGANDA 4975.96, Radio Uganda, Kampala, on late Aug 18 2245-2314*, with religious programming in vernacular and English. Quite a few "Praise the Lord" statements. IDs. Local music. Abruptly pulled plug mid-sentence at 2314. Fair signal (Brian Alexander, PA, *DXLD*) I wonder what the occasion was? (gh) Yes, 4976 after 2100 is quite irregular. Also in past years there were various days when they closed down later, but I can't see any schedule behind that. 5026 seems to be off; at least it wasn't logged for a couple of months (Thorsten Hallmann, Germany, *DXLD*) Normal schedule is *0300/2105* (gh) Another day heard opening at 0200 with phone calls from listeners in English (Rumen Pankov, Bulgaria, *Australian DX News*)

UKRAINE RUI changed all its frequencies Sept 23; concerning English: to NAm 0000 & 0300, 5820 Lviv, 600 kW, 303 degrees. To WEu, all Kharkiv, 100 kW: 0500 & 0700, 7420, 277 degrees; 1100, 9950, 277; 1900 & 2100, 5830, 290; to Russia 1400, 5830, 55 degrees (via *DX Mix News*, Bulgaria) B-07 registered three alternative 7 and 9 MHz frequencies for NAm, 600 kW, but surely will stay on lowest frequency for winter, shifting like many stations one UT hour later Oct 28, now a week before we quit DST (gh)

U S A In early Sept, EurAsianet.org reported that plans to eliminate the Voice of America's Uzbek service were likely to be shelved due to opposition in both houses of the US Congress. The House and the Senate recommended "sufficient funding to fully restore the reductions proposed in the fiscal year 2008" and "continuing broadcasting which the administration proposed for language service reduction," including Uzbek. A joint House-Senate conference will address a $7 million discrepancy in the two proposed budgets, and come up with a unified spending bill. According to a spokeswoman for the Senate Committee on Appropriations, "the conference committee should definitely happen before Christmas. We can't say exactly when, but the sooner the better. Senator [Robert] Byrd, [a West Virginia Democrat and the committee's chairman], is anxious to get the bill through." (via *Media Network*)

VENEZUELA [non] Cut numbers (spy letters in code instead of numbers in voice), on 15290 at 1915; later in the hour. R. Nacional de Venezuela instead (Liz Cameron, MI, Rich Zolla, CA, *DXLD*) RNV then heard in the 19-20 hour on 15290 (Bernie O'Shea, Ont., *ibid.*) Very strong here; probably successor to transmission for "San Francisco" via Cuba in April 2004, originally on 13740 but missing for a year or two. Chávez' Sunday show *Aló, Presidente* nominally runs 1400-1830, but often heard as late as 1950 via Cuba on 11670, 11875, 13680, 17705. Sometimes this preëmpts the 1900 daily broadcast, sometimes not, or it starts late on 15290 (gh, OK, *WORLD OF RADIO*)

WESTERN SAHARA [non] R. Nacional de la RASD, 6300, in Sept once again shifted its Spanish hour from 1700 to 2300-2400* (Carlos Gonçalves, Portugal, *DXLD*) So we can hear it too. Also audible in Arabic from 0600 (gh, OK)

ZIMBABWE [non] VOA's *Studio 7* service to Zimbabwe at 1700-1830 expanded in mid-August from 5 days a week to 7, on 909, 4930, 13755, 15775 (VOA News via Mike Barraclough, England) 1730-1800 in English (gh) Except weekends English at 1720-1740 within 60-minute broadcast (S. Aoki, NDXC schedule) B-07, plans to remain on 15775 and 4930 at least (gh)

Until the Next, Best of DX and 73 de Glenn!

BROADCAST LOGS

NOTEWORTHY LOGS FROM OUR READERS

Gayle Van Horn, W4GVH
gaylevanhorn@monitoringtimes.com
http://mt-shortwave.blogspot.com

0050 UTC on 9590
CHINA: China Radio International. Male/female announcer's text followed by instrumental music. Faded below noise level or possibly closed service at 0057. Poor signal, SINPO 23222. (Jim Evans, Germantown, TN) China's **Sichuan PBS-2** 6060, 1042-1105. Chinese programming for pop music, brief ID at 1100 "this is the Voice of the Golden Bridge." Music variety of rap and easy-listening Chinese tunes. Fair signal on // 7225 with QRM on 7220. Rechecked 6060 at 1120 to find Venezuela's Radio Nacional de Venezuela via Cuba. China's **Guangxi PBS** 9820, 1110-1128 in Vietnamese, clear on // 5050 with above average reception conditions. (Ron Howard, Monterrey, CA) **PBS Quinghai, Xining** 4750, 0918-1230. Tentative on carrier rising above noise. Signal peaked by 1130 and holding steady to 1230. Signal dominated by Indonesian throughout. Minimal CODAR interference noted. (Brandon Jordan, Memphis, TN)

0150 UTC on 5919
INDIA: All India Radio-Thiruvanathapuram. Tune-in with singing to male's Hindi commentary at 0254. Poor signal as commentaries continued after 0200. (Chuck Bolland, Clewistown, FL) AIR-Bangalore 9445, 2050. (Bob Fraser, Belfast, ME) **AIR-Port Blair** 4760, 1040. Carrier noticed rising about 1040 and peaking around 1200, but not strong enough to produce audio. Presumed based on peak coinciding around Port Blair sunset. (Jordan).

0206 UTC on 6059.9
ARGENTINA: Radio Nacional. Found while tuning with strong het, best in LSB. Heard host Eduardo Aliverti with music program *Dos Gardenias* and live audio at station website. Noted het on 6020 for Peru's Radio Victoria on 6019.36 with decent signal in LSB. (Howard) Tentative on Argentina's **Radio Baluarte** 6124.48, 2357-0012. Spanish music to announcer at 0001, but no chance of ID amid interference. Signal buried by 0012. Poor signal. (Scott Barbour, Intervale, NH)

0245 UTC on 4909.21
ECUADOR: Radio Chaskis del Norte. Spanish talks by male announcer and lots of indigenous Andean music of panpipes and mentions of Ecuador, but no identification. Mainly very poor but better after 0510. Ecuador's **Radio El Buen Pastor** 4814.98, 0254-0309 and 0855-1145. Tentatively heard in Spanish with religious program and sign-on announcement 0300.* Transmitter back up at 0855 and improved by 1030 with religious programming. Mainly poor signals. (Jordan).

0345 UTC on 4750
SUDAN: Radio Peace (tentative). Arabic/Vernacular. Male/female talking over brief musical bridge. Poor signal, SINPO 24222. Sudan's **Radio Omdurman** 7200, 0403-0415. Newscast with correspondent's report. Moderate signal for SINPO 33333. (Evans).

0845 UTC on 9765
RUSSIA: Radiostantsiya Okean. Tuned in late to hear bits of Russian comments as signal faded briefly. Signal threshold to nil. (Bolland)

0945 UTC on 5014.15
PERU: Radio Altura. Signal noise and poor conditions during male announcer's Spanish text including music between items. Peruvians in Spanish audible: **Radio Victoria** 6019.88, 1045-1055; **Radio La Hora** 4857.41, 2345-2359. (Bolland)

1011 UTC on 6890
USA: KNLS-Alaska. Religious testimonials between pop music. Several station promos and identifications amid poor signal quality. (Barbour) **WHRI** 7315, 2330. *Radio Weather* program. SIO 454. **Radio Taiwan** via Okeechobee, FL 15600, 2210. (Fraser)

1020 UTC on 4805
BRAZIL: Radiodifusora do Amazonas. Portuguese. News and weather update. Station ID: "Radiodiffusora do Amazonas - operando 4805 kilohertz - ondas tropicais." SINPO 24332. Brazilians in Portuguese audible: **Radio Cultura Ondas Tropicais** 4845, 1025-1031; **Radio Rio Mar** 9694.81, 1052-1100. (Arnaldo Slaen, Buenos Aires, Argentina) Presumed ID for **Radio Brasil** 4785, 0138-0209.*

(Bolland). **Radio Imaculada** (ex Rural Educacao Rural) 4754.82, 1004-1038. (Howard)

1030 UTC on 6134.80
BOLIVIA: Radio Santa Cruz. Spanish. Language lesson format. Checking this freq since 0900 and caught while bandscanning recheck. (Bolland) Bolivians logged in Spanish: Radio Universitaria 4732.03, 1035; San Gabriel 6079.98, 1036-1042; Radio Chicha 4762.75, 1055-1105; Radio Logos 6165, 1106-1110. (Slaen)

1048 UTC on 9965
PALAU: T8BZ. Lady announcer's Mandarin text to instrumental music at 1059. Mentions of Palau followed by station identification and fanfare music at 1100. Fair signal. (Barbour).

1050 UTC on 9505
CUBA: Radio Rebelde. Spanish. Local time check: "las 6 de la mañana con 57 minutos-vamos al centro del pais." Report from Santa Clara to station announcement and ID. (Slaen). Radio Havana 9550, 2335. DXers Unlimited program. SIO 454. (Fraser).

1050 UTC on 6095
NEW ZEALAND: Radio New Zealand International. News items covering on going problems in Fiji. SIO 454. (Fraser). Station monitored *1259-1230+. Interval signal, time pips and ID. *Dateline Pacific* 1309-1329. Very good signal. New Zealand's **ZLXA** 3935. Tentative on station heard 1153-1214. (John Wilkins, Wheat Ridge, CO).

1115 UTC on 6100
CANADA: Radio Japan relay. Nature program on the crows of Tokyo. SIO 555. (Fraser). **CFVP** 6030, 1224. *Classic Country Traffic* to local time check, jingles and C&W music. Fair signal with interference from China station. (Wilkins). **Radio Canada International** 6100, 2304. **Radio Austria International** via Sackville, Canada relay 13775, 1530 *Report From Australia*. (Fraser).

1145 UTC on 6130
LAOS: Lao National Radio. Announcer's talk to 1159 including two breaks for Lao vocal music. Interval signal of regional instruments at 1159 followed by seven chimes tolling the local for local Laos seven p.m. Presumed newscast for fairly good signal. Still fair at 1300 recheck. Not often heard this well at my location. (Wilkins).

1230 UTC 7220
VIETNAM: Voice of Vietnam. Russian transmission opening with "Govorit Golos Vietnam," followed by news and talks from announcer. Good signal despite amateur radio interference after 1244. Parallel program on 9550.2 into Chinese at 1300. (Wilkins). **Radio Son La** 4739.71, 1145-1225. Bits of barely threshold audio, transmitter drifting frequency. Signal faded below noise level by 1225. (Jordan).

1246 UTC on 4920
TIBET: Xizang PBS. Male/female chat in presumed Tibetan over background music past 1300. Searching for RRI-Biak but no sign of Indo. Xizang noted on // 4905, 6200 and 7125. (Wilkins).

1900 UTC on 9290
LATVIA: Radio SWH. *Latvia Today* program. Sign-on announcements with identification and Radio SWH address. Local pop music to ID/address repeat. Poor, very weak signal and difficult to gather program details to 2000.* (Brian Alexander, PA)

2110 UTC on 12085
SYRIA: Radio Damascus. Regional style music to English news at 2115, returning to music. News summary at 2208 and abruptly off the air at 2210. Very strong carrier for somewhat low modulation and slight audio hum. Better on // 9330. (Alexander).

Thanks to our contributors – Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times
English broadcast unless otherwise noted.

WHAT'S ON WHEN AND WHERE?

Fred Waterer
fredwaterer@monitoringtimes.com
www.doghousecharlie.com/radio

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"The 21st Century has begun with an enormous interest in world religions and a sharpened need for accurate, independent information and analysis of faith traditions, ethics and spirituality.

"This is particularly the case as political events across the world intersect with religious belief and practice in many communities." (**www.abc.net.au/religion/about/**)

I've always been curious... Curious about history. Politics. Philosophy. And yes, Religion. One cannot listen to today's news without hearing some reference to religion. Whether it's Sunni or Shia Islam, Protestant, Catholic or Orthodox Christianity or Judaism, there is no doubt that these faiths still have a major impact on the events of today, and that there is a great interest in understanding them.

There are many kinds of religious programs available via shortwave and the internet. Anyone who has ever spun the dials on a radio will have encountered this programming in one form or another. On any given night one can work their way up and down the dial and encounter fire and brimstone preachers, gospel music, Koran recitations, religious teaching and panel discussions.

This month, we shine the programming spotlight on programs by secular international broadcasters, which focus on matters of faith in society today.

❖ Radio Australia - *The Religion Report*

*"This weekly half-hour program offers analysis of events shaping the world of religion and the religious events that increasingly seem to be shaping our world. Listen to the *Religion Report* if you're interested in the interaction between culture, politics, history, theology, philosophy, law and spirituality."* (RA Website)

I first heard this program via the CBC Overnight program block. It's an interesting program hosted by Stephen Crittenden. Crittenden is a longtime presenter in Australia, first as a current affairs reporter and later as an arts reporter, as well as a TV presenter for the arts program *Express*.

"In 1998 Stephen returned to ABC Radio to become executive producer of ABC Radio Religion. He produced ABC Radio National's highly acclaimed marathon radio history of the second millennium, *A Thousand Years in a Day*, and in 2001 was artistic associate of the Melbourne International Arts Festival, responsible for curating another highly acclaimed large-scale project, The Alfred Deakin Lectures, which celebrated the Centenary of Federation. The lectures were also broadcast on Radio National."

Some recent topics have included a proposed "Mega-Mosque" in London, the expulsion of Christian missionaries from China in advance of the Beijing Olympics, and issues surrounding Catholic education in Australia. Crittenden deals with all issues in a fair and balanced manner. This program is, in my opinion, perhaps the best of those discussed.

You can hear *The Religion Report* on UTC Wednesdays at 0630, 1030, 1530 and 1930. **www.abc.net.au/rn/religionreport/default.htm**

❖ CBC - *Tapestry*

Each week Mary Hynes speaks with a guest or two about spirituality, religion and the search for meaning.

"Mary began her career as a journalist in 1983 with United Press Canada. From 1984 to 1987, she worked overseas as a freelance sports writer/correspondent for CBC Radio, Broadcast News, Canadian Press, *The Globe and Mail* and Southam newspapers. In 1987, as a news and feature writer in *The Globe and Mail*'s sports department, Mary covered the 1988 Seoul Olympics and the subsequent Dubin Inquiry into drugs in sports, winning a Sports Canada Award. In 1989, Mary came to CBC Radio One as the host of *The Inside Track*. The program won a Bronze Award at the New York Radio Festival in 1991 and was judged 'CBC Radio/Best Weekly Show' in 1993.

"In 1994, Mary moved to TVO (TV Ontario) to co-host the daily current affairs program Studio 2. In 1997, she became host of *Imprint*, TVO's weekly literary program. She returned to CBC Radio One in 2000 to host the summer series *Body and Soul*, an exploration of the human body through medicine, culture, sociology and humour. *Body and Soul* won a Bronze Award at the New York Radio Festival in 2001. Mary also hosted the Discovery Health Channel's Open Heart, a series of conversations about humanistic medicine. She has been a frequent and popular guest host on programs such as *As It Happens* and *The Arts Today*.

"Recently, *Tapestry* won the 2006 CBC Radio Program Award in the 'Best Network Weekly' category."
www.cbc.ca/tapestry/host.html

Recent episodes of *Tapestry* have included segments on Dr Francis Collins, a geneticist who headed the Human Genome Project, and his book *The Language of God: A Scientist Presents Evidence for Belief*. Another program featured Bob Lozoff who ministers to prisoners.

The program can be heard Sundays at 2:05 p.m. ET, AT, CT, 2:35 NT, 3:05 PT, and 4:05 MT on CBC Radio One. Also try the CBC Northern Quebec Service on 9625 kHz at 1905 UTC.

❖ Deutsche Welle - *Dialogue*

"Tune into Dialogue for news on religious events, insights into the changing relationships between the world's religions, and background reports on religious social and cultural movements.

*"Hosted by Angelika Ditscheid, *Dialogue* is different from the usual religious program on air – it providing space for different faiths and philosophies.*

"Discover how young Moslems celebrate Ramadan in a non-Islamic country. Listen to a Jewish historian talking about the role of German Jews in a united Europe. Find out why it took 600 years to complete Cologne's cathedral. Or just enjoy the meditative sound of a Zen bamboo flute on Dialogue."

"Angelika joined Deutsche Welle Radio in 1990 and since then has worked in various departments and program.

"A native of Cologne, Germany, (she) has a multi-lingual and varied background – she completed a Bachelor of Arts Honours degree

in African history and Swahili at the School of Oriental and African Studies in London and a postgraduate degree at Paris-based Sorbonne.

"After traveling extensively throughout Africa, Angelika lived and worked as a Hollywood correspondent for a German film magazine in Los Angeles for five years. During that time, she also produced documentaries featuring Native Americans.

"Angelika has a special interest in religion – her university education included Islamic Studies, and she spent the Catholic Holy Year of 2000 in Rome."

I find this program to be very well done. I heard a fascinating segment about a Jewish festival in Berlin recently.

This half-hour weekly program is broadcast on Fridays and Saturdays [0930 (Fri) 15340, 17705 kHz (Far East); 1630 (Fri) 6170, 9485 and 15640 kHz (to South Asia); 2030 and 2130 (Sat) 15205, 11795, 11865, 7130 kHz (to Africa). The African broadcast would probably be the best bet]. Or listen to the audio stream here on the Internet (Fri) 0530, 0730, 0930, 1130, 1330, 1530, 1730, 1930, 2130, 2330; (Sat) 2030, plus on demand for 7 days.
www.dw-world.de

❖ Radio New Zealand

Spiritual Outlook - "A seasonal interview-based programme on spiritual topics of wide ranging interest, alternating with Touchstone."

Recent programs have featured talks with Bernie Prior who runs courses to help people reach self-realization, and with Abdullah Drury a New Zealander who converted to Islam.

Maureen Garing hosts the program, UTC Sundays at 1750 UTC. (Note there is a conflict here, as the programs are 23 to 24 minutes in length but are scheduled in a 10 minute slot on the program grid on the RNZI website. Reception in North America at that time might be problematic anyway, but the program is available for download online.)
www.radionz.co.nz/nr/programmes/spiritualoutlook

Touchstone - "A series exploring diverse spiritual, moral and ethical issues and topics, in four, six-week seasons alternating with Spiritual Outlook."
www.radionz.co.nz/nr/programmes/touchstone

❖ Voice of Russia

The Christian Message from Moscow - "A weekly program telling you about Orthodoxy, about the lives of the Saints, works by Orthodox Saints, sermons by priests and monks, spiritual prose by Russian authors. It covers the most interesting Orthodox periodicals, looks at the composers, performers and the history of the Russian church music, features stories by laymen and clerics recounting how they found their way to the Lord. It's about the believers' life and their effort bent for the sake of Our Lord Jesus Christ. We are also trying to answer your questions and preparing a new series of programs about the history of the Russian Orthodox Church. The program is prepared by Tatyana Shvetsova."

www.ruvr.ru/main.php?lng=eng&rt=115&p=

Unlike the other programs reported on in this column, this program focuses strictly on the Russian Orthodox viewpoint. As a longtime listener of Radio Moscow and The Voice of Russia, I find this program and its sister program *Spiritual Flowerbed* (see below) striking. Perhaps the clearest evidence that the times have really changed since 1991-92 in Russia. One can't imagine such a program being produced in Soviet times.

I like these programs. My university major was Slavic Studies, so obviously I have an interest in Russia, its history and culture. The choral music, which you will hear in abundance, is breathtakingly beautiful. Before the 1917 Revolution, Russia had almost a thousand years of Byzantine influenced Christianity, and leaders both spiritual and temporal envisioned Moscow as a "Third Rome" (after Rome and Constantinople). It's clearly making a comeback.

Tune in to *The Christian Message* from Moscow on Saturday at 01.30, 05.30, 08.30, 15.30 and 19.30 and Sunday at 18.30 UTC.

Spiritual Flowerbed - "a brief supplement series to our weekly feature *The Christian Message from Moscow* addressing not only Christians but all the people, concerned with matters spiritual. In the programs of the series you'll get acquainted with reflections and recommendations from the clergy and authoritative figures of the Russian Orthodox Church. The series is prepared by Tatyana Shvetsova. (It was interesting to hear announcers I remembered from Soviet days, waxing poetic about the views of a Russian saint – fw)

"Please tune in to '*Spiritual Flowerbed*' on Monday and Wednesday at 16.30 and 18.30 and Tuesday and Thursday at 03.30 UTC." **www.ruvr.ru/main.php?lng=eng&rt=165&p=** (Also note that selected editions of both Christian Message from Moscow and Spiritual Flowerbed are available for listening or download via the Voice of Russia website under the program listing.)

❖ Channel Africa - *The Inner Voice*

This is certainly a "spiritual" program…but to my mind it's a bit "out there."

According to the Channel Africa website "The Inner Voice is a weekly inspirational program, presented and produced by healer and author Lou Bognon. The objective of the program is to help listeners cope with everyday realities and challenges facing us and our continent, by exploring spiritual truths and principles. The INNER VOICE is a new way of talking about, thinking of, seeing and experiencing, our continent, our lives and our world.

"At the *Inner Voice* the key words are sharing greater love, greater compassion, greater understanding and wisdom - The Inner Voice is about Ubuntu (Humanity) and the spiritual principles of a real African Renaissance."

The presenter has her own website at **www.loubognon.com**.

Lou certainly has a way with words. Speaking about "Mother Earth" she writes on her website: "Become her life line – send her your love and gentle words. Act for Her: sell your gas guzzler, plant more trees, walk on Her body with your bare feet and tell her you love her often, become a mindful consumer, live from the heart, and whatever you do, buy, create, invent, sell, connect to her to find out if it is good for her and all the life forms she supports. She needs our collective healing love. Now! The more of us do this the faster she will choose to heal. By not changing anything in our lives and in our behaviour, we choose to experience the alternative: sleep in the bath water with her and perhaps never wake up again on her loving heart."

"Lou BOGNON is a spiritual healer, author, teacher, producer and presenter of The Inner Voice, an inspirational program on Channel Africa which is broadcast internationally in English and French."

It's not clear if this is paid time, or endorsed by Channel Africa. But it's certainly something a little different. I listened to an episode online (downloadable). Even without the instability of shortwave signals, I found her Afrikaans-accented English a bit hard to follow at times. Not to mention some of her ideas. The program can be heard on Sunday at 0715 UTC on 7240 kHz and Tuesday at 0515 on 9685 kHz.

❖ BBC - *Reporting Religion*

Of course the BBC World Service has a program in this genre. Called *Reporting Religion*, it looks at current stories in the worldwide faith community. A recent episode of the program looked at the appointment of an American bishop by the Ugandan Anglican Church and a split in the Church over gay marriage. It also looked at splits in the Shiite community in Iraq and an interview with the Patriarch of the Ethiopian Orthodox Church and their millennium celebrations (by the Ethiopian calendar, this is the year 2000).

The *Reporting Religion* program is updated on the World Service website every Saturday at 2332 UTC.
www.bbc.co.uk/worldservice/programmes/reporting_religion.shtml

THE QSL REPORT

VERIFICATIONS RECEIVED BY OUR READERS

Gayle Van Horn, W4GVH
gaylevanhorn@monitoringtimes.com

Medium Wave QSLing

As medium wave bands expand and AM DXers continue their quest for collecting, November and the approaching winter months present an enhanced listening opportunity for medium wave enthusiasts.

Reception reports begin with the date, time (in the station's local time), frequency and program details. Details may include on-air personality names, public service announcements, station identifications, sporting events, commercials or program format. A word-by-word description isn't necessary, but verifiable details should be included. If music is presented, song titles or artist should be listed, and twenty to thirty minutes is adequate for any program reporting.

Reception reports or letters should be friendly or conversational.

DXers usually include a bit about themselves or their listening equipment. A basic explanation of medium wave DXing and QSLing should assist staff personnel who may not understand the concept of medium wave pursuits. Letters should be directed to the General Manager, Program Director or Chief Engineer.

Email and CD reporting have increased among serious AM hobbyists and may be the alternative you've been searching for.

If reporting via the postal service, include two mint postage stamps to U.S. addresses, and an SASE to the smaller market stations. Enclosing souvenir post cards, tourist brochures or photos are always suggested.

Keep the reporting brief, complete and to the point. The impression you present may affect future medium wave DXers.

ASCENSION ISLAND

NHK Radio Japan relay 11855 kHz. Full data *Water-Borne Doll Festival* card unsigned, plus schedule. Received in 135 days – 28 days after posting follow-up report on their website **www.nhl.or.jp.rj** (Edward Kusalik, Alberta, Canada)

CANADA

KBS World Radio/Korean Broadcasting System via Sackville relay, 9650 kHz. Full data color card of Incheon International Airport unsigned, plus schedules and station stickers. Received in 26 days for an English report and souvenir postcard. Station address: Global Center, Korean Broadcasting System, Yoido-dong 18, Youngdeungpa-gu, Seoul, Republic of Korea. Website: **http://world.kbs.co.kp** (Tom Banks, Dallas, TX)

Radio Sweden via Sackville relay, 6010 kHz. Full data *Stockholm/Nybroviken* card excluding transmitter site. Schedule and book marker tag enclosed. Received in 130 days after posting a follow-up report on their website at **www.sr.se.rs** . (Kusalik) Email: *radiosweden@ar.se* Station address: SE-105 10 Stockholm, Sweden.

CLANDESTINE

Russia/Chechnya. Radio Free Chechnya/Radio Chechnya Svobodnaya: via St. Petersburg 7330 kHz. Full data including site, power and "Radio Chechnya Svobodnaya." Card includes St. Petersburg Regional Center transmitter and antennas. Received in 7.5 years with no follow-up report. QSL address: St. Petersburg Regional Center, 3, Akademika Pavlova st., St. Petersburg 197022 Russia. (Wendel Craighead, Prairie Village, KS)

Zimbabwe-SW Radio Africa via Rampisham, United Kingdom 12035 kHz. Full data (except for transmitter site) multi-color card signed by Station Manager with illegible signature. Received in 17 days for an email report. Several email addresses used and most kept bouncing. (Craighead) Correspondence address and web information via *World QSL Book;* SW Radio Africa Ltd., P.O. Box 243, Borehamwood, Herts WD64WA United Kingdom. Website: **www.swradioafrica.com** Email: *mail@swradioafrica.com* (or) *tech@swradioafrica.com*.

Zimbabwe-Radio Voice of the People via Talata-Volondry, Madagascar - Radio Netherlands Relay Station, 11695 kHz. Full data (including program name and transmitter coordinates) Radio Netherlands card signed by Rahamefy Eddy. Received in two months for report to veri signer at Radio Netherlands Relay Station. Additional large folder Madagascar map card enclosed for 7310 kHz from 4.5 years ago, that included full data and the program name. QSL address: Radio Nedherlands Wereldomroep Relay Station, Atten: Mr. Rahamefy Eddy, P.O. Box 404, Antananarivo, Madagascar. (Craighead) Correspondence address and web information via *World QSL Book;* Radio Voice of the People, P.O. Box 5750, Harare, Zimbabwe. Website: **www.vopradio.co.zw/** (or) **www.radio.vop.com** Email: *voxpozim@yahoo.com.uk* (or) *voxpop@coweb.co.zw*

MEDIUM WAVE

Japan-JOJK Kanazawa 1224 kHz AM. Full data NHK card unsigned. Received for an AM report and no return postage. Station address: 14-1 Ohtemachi, Kanazawa City, Ishikawa, Japan 920-8644. (Craig Edwards, Nhulunbuy (Gove) NT Australia)

Japan-JOUC Yamaguchi 1377 kHz AM. Full data NHK card unsigned. Received for an AM report and no return postage. Station address: NHK Yamaguchi, Techniclal Dept., 2-1 Nakazono, Yumaguchi-shi, Yamaguchi, Japan 753-8660. (Edwards).

KSGM 980 kHz AM. Full data friendly two-page letter signed by Don Pritchard-News Director. Veri signer states he too is an AM DXer. Station's night pattern coverage map and felt KSGM pennant enclosed. Received in ten days for an AM report. Station address: P.O. Box 428, Ste. Genevieve, MO 63670. (Jim Pogue, Memphis, TN)

KLBS 1330 kHz AM. *The Portuguese Radio Network.* Full data card signed Operations Manager with illegible signature, plus station information sheets. Received in 60 days for an AM report and two mint stamps. Station address: 401 Pacheco Blvd., Los Banos, CA 93635. Website: **www.klbs.com/**. (Henry Tidenberg, Clovis, NM)

KTRH 740 AM kHz. Full data email response from Ken Charles-Regional VP of Programming. Received in three days after follow-up email report to *kencharles@clearchannel.com* Station address; 2000 West Loop South, Suite 300, Houston, TX 77027. Website: **www.ktrh.com/main.html**. (Frank Hillton, Charleston, SC).

Mexico-XENK 620 kHz AM. Personal letter via registered mail from Ma. Guadalupe Laris Rodriguez-Gerente. Received via registered mail after follow-up report October 2006, mailed from Cozumel, Mexico. Station address: Radio 6.20, S.A., Aten: Lic. Guadalupe Laris Rodriguez, Calle Durango #331, Colonia Roma, Mexico, DF 06700 Mexico. (Pogue).

WTAW 1620 kHz AM. *News Talk 1620.* Full data color QSL card signed by Ben Downs-Chief Operator. Received in six weeks for an AM report and mint stamps. Station address: 2700 Rudder Freeway, Suite 5000, College Station, TX 77845. Website: **www.wtaw.com/** Email: *radio@wtaw.com* (Sam Wright, Biloxi, MS).

NORTH KOREA

Voice of Korea 11710 kHz. Full data color *Radio Pyongyang* card signed in Korean and dated on my birthday. Cloth pennant, color enameled *Voice of Korea* lapel pin, program schedule, three advertising brochures for North Korean postage stamp collectors and copy of *Pyongyang Times* newspaper. Received in 57 days for an English report directly to the station. Have been trying nearly 20 years using every trick in the book with no success. Packet of goodies was received in a plain brown wrapper. Station address: Voice of Korea, Pyongyang, Democratic People's Republic of Korea, (Richard W. Parker KB2DMD, Gerryville, PA).

Photo Credit Gayle Van Horn

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HOW TO USE THE SHORTWAVE GUIDE

• •

0000-0100 twhfa   USA, Voice of America   5995am   6130ca   7405am   9455af
①   ②   ⑤   ③   ④   ⑥ ⑦

Convert your time to UTC.

Broadcast <u>time on</u> ① and <u>time off</u> ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Standard Time) 5, 6, 7 or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each hour.

Note that all *dates*, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 7:30 pm Eastern, 6:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. English broadcasts are listed by UTC <u>time on</u> ① , then alphabetically by <u>country</u> ③, followed by the <u>station name</u> ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the <u>days of broadcast</u> ⑤ will appear in the column following the time of broadcast, using the following codes:

Codes
s/Sun	Sunday
m/Mon	Monday
t	Tuesday
w	Wednesday
h	Thursday
f	Friday
a/Sat	Saturday
occ:	occasional
DRM:	Digital Radio Mondiale
irreg	Irregular broadcasts
vl	Various languages
USB:	Upper Sideband

Choose the most promising frequencies for the time, location and conditions.

The <u>frequencies</u> ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment prob-

lems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring team and *MT* readers to make the Shortwave Guide up-to-date as of one week before print deadline.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the <u>target area</u> ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas
af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
ca:	Central America
do:	domestic broadcast
eu:	Europe
me:	Middle East
na:	North America
pa:	Pacific
sa:	South America
va:	various

MT Monitoring Team

Gayle Van Horn
Frequency Manager
gaylevanhorn@monitoringtimes.com

Larry Van Horn, MT Asst. Editor
larryvanhorn@monitoringtimes.com

Thank You …

Additional Contributors to This Month's Shortwave Guide:
Rich D'Angelo/*NASWA Flash Sheet*; Rachel Baughn/*MT*; Wolfgang Bueschel, Germany; Bob Fraser, Belfast, ME; Alokesh Gupta, New Delhi, India; Ivo Ivanov; Stewart MacKenzie, CA; Anker Petersen/*DSWCI-DX Window*; Daniel Sampson/*PTSW*; Harold Sellers/*ODXA DX Ontario*; Bernard Trutenau, Lithuania; Andreas Volk, Germany. *CIDX; Cumbre DX; BDX Club; DX Mix News; DX Magazine; Hard-Core-DX; NASWA Journal; Worldwide DX Club/ Top News; WYFR.*

Shortwave Broadcast Bands

kHz	Meters
2300-2495	120 meters (Note 1)
3200-3400	90 meters (Note 1)
3900-3950	75 meters (Regional band, used for broadcasting in Asia only)
3950-4000	75 meters (Regional band, used for broadcasting in Asia and Europe)
4750-4995	60 meters (Note 1)
5005-5060	60 meters (Note 1)
5730-5900	49 meter NIB (Note 2)
5900-5950	49 meter WARC-92 band (Note 3)
5950-6200	49 meters
6200-6295	49 meter NIB (Note 2)
6890-6990	41 meter NIB (Note 2)
7100-7300	41 meters (Regional band, not allocated for broadcasting in the western hemisphere) (Note 4)
7300-7350	41 meter WARC-92 band (Note 3)
7350-7600	41 meter NIB (Note 2)
9250-9400	31 meter NIB (Note 2)
9400-9500	31 meter WARC-92 band (Note 3)
9500-9900	31 meters
11500-11600	25 meter NIB (Note 2)
11600-11650	25 meter WARC-92 band (Note 3)
11650-12050	25 meters
12050-12100	25 meter WARC-92 band (Note 3)
12100-12600	25 meter NIB (Note 2)
13570-13600	22 meter WARC-92 band (Note 3)
13600-13800	22 meters
13800-13870	22 meter WARC-92 band (Note 3)
15030-15100	19 meter NIB (Note 2)
15100-15600	19 meters
15600-15800	19 meter WARC-92 band (Note 3)
17480-17550	17 meter WARC-92 band (Note 3)
17550-17900	17 meters
18900-19020	15 meter WARC-92 band (Note 3)
21450-21850	13 meters
25670-26100	11 meters

Notes
Note 1   Tropical bands, 120/90/60 meters are for broadcast use only in designated tropical areas of the world.
Note 2   Broadcasters can use this frequency range on a (NIB) non-interference basis only.
Note 3   WARC-92 bands are allocated officially for use by HF broadcasting stations in 2007 WRC-03 update.
Note 4   After March 29, 2009, the spectrum from 7100-7200 kHz will no longer be available for broadcast purposes and will be turned over to amateur radio operations worldwide

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GLENN HAUSER'S WORLD OF RADIO
http://www.worldofradio.com

For the latest DX and programming news, amateur nets, DX program schedules, audio archives and much more!

0000 UTC - 7PM EST / 6PM CST / 4PM PST

Start	Stop		Station	Freq1	Freq2	Freq3	Freq4
0000	0005		Greece, Voice of	7475eu	9420eu	15640eu	
0000	0020		Japan, NHK World/Radio Japan				5960eu
				6145na	13650as	17810as	
0000	0027		Czech Rep, Radio Prague	7345na	9440na		
0000	0030		Australia, HCJB Global	15525va			
0000	0030		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	17715as	17750va
				17775va	17795va		
0000	0030		Burma, Dem Voice of Burma	5955eu			
0000	0030		Egypt, Radio Cairo	9460na			
0000	0030		UK, BBC World Service	3915as	5970as		
				17615as			
0000	0030		USA, Voice of America	7555as			
0000	0045		India, All India Radio	9690as	9705as		
				11620as	11645as	13605as	
0000	0045		USA, WYFR/Family Radio FL	17805am			
0000	0056		Romania, Radio Romania Intl	9775na	11790na		
0000	0057		Canada, Radio Canada Intl	11700as			
0000	0058		Germany, Deutsche Welle	7245as	15595as		
0000	0059		Spain, Radio Exterior Espana	6055na			
0000	0100		Anguilla, University Network	6090am			
0000	0100		Australia, ABC NT Alice Springs				2310do
				4835do			
0000	0100		Australia, ABC NT Katherine	5025do			
0000	0100		Australia, ABC NT Tennant Creek				4910do
0000	0100		Canada, CFRX Toronto ON	6070na			
0000	0100		Canada, CFVP Calgary AB	6030na			
0000	0100		Canada, CKZN St John's NF	6160na			
0000	0100		Canada, CKZU Vancouver BC				6160na
0000	0100		China, China Radio Intl	6020na	6075na		
				7180as	9570as	9725as	11885as
				13750as	15115as		
0000	0100		Costa Rica, University Network				5030va
				6150va	7375va	9725va	
0000	0100		Guyana, Voice of	3291do			
0000	0100		Malaysia, RTM/Trax FM	7295as			
0000	0100		Netherlands, Radio	9845na			
0000	0100		New Zealand, Radio NZ Intl	15720pa			
0000	0100	DRM	New Zealand, Radio NZ Intl	13730pa			
0000	0100	vl	Papua New Guinea, Wantok R. Light		7325va		
0000	0100		Russia, Voice of	7250na	9665na	12755na	
0000	0100		Singapore, MediaCorp Radio	6150do			
0000	0100		UK, BBC World Service	6195as	9580as		
				9740as	11955as	15335as	15360as
0000	0100	f	UK, Bible Voice BC	6140as			
0000	0100		Ukraine, Radio Ukraine Intl	5820na			
0000	0100		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
0000	0100		USA, KAIJ Dallas TX	5755va			
0000	0100		USA, KTBN Salt Lake City UT	7505na	15590na		
0000	0100	twhfas	USA, WBCQ Monticello ME	9330am			
0000	0100		USA, WBOH Newport NC	5920am			
0000	0100		USA, WEWN Vandiver AL	5810na			
0000	0100		USA, WHRA Greenbush ME	7520na			
0000	0100		USA, WHRI Cypress Creek SC				7315am
				7520am			
0000	0100	mtwhfa	USA, WHRI Cypress Creek SC				9515am
0000	0100	Sun	USA, WHRI Cypress Creek SC				7490am
0000	0100		USA, WINB Red Lion PA	9265am			
0000	0100		USA, WRMI Miami FL	9955va			
0000	0100		USA, WTJC Newport NC	9370na			
0000	0100		USA, WWCR Nashville TN	5070na	7465na		
				13845na			
0000	0100	mtwhfa	USA, WWRB Manchester TN	5745am			
0000	0100		USA, WWRB Manchester TN	3185va	5050va		
				6890na			
0000	0100		USA, WYFR/Family Radio FL	6065am	9595am		
				11835am			
0005	0100		Canada, Radio Canada Intl	6100na			
0030	0045	Sun	Germany, Pan American BC	6165na			
0030	0100		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15415as	17715as
				17750va	17775va	17795va	
0030	0100		Lithuania, Radio Vilnius	11690na			
0030	0100		Thailand, Radio	5890na	9570af		
0030	0100	fas	UK, Bible Voice BC	9620as			
0030	0100		USA, Voice of America	9715va	9780va		
				11725va	15185va	15205va	15290va
				15560va	17820va		
0030	0100	Fri-Sun	USA, WYFR/Family Radio FL	9620as			
0035	0058	Sun/Mon	Austria, Radio Austria Intl	9870am			
0043	0058	twhfa	Austria, Radio Austria Intl	9870am			

0100 UTC - 8PM EST/ 7PM CST / 5PM PST

Start	Stop		Station	Freq1	Freq2	Freq3	Freq4
0100	0104		Canada, Radio Canada Intl	6100na			
0100	0115	vl	Pakistan, Radio	7445eu	9350al		
0100	0127		Czech Rep, Radio Prague	6200na	7345na		
0100	0127		Slovakia, Radio Slovakia Int	5930na	9440sa		
0100	0130		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15415as	17715as
				17775va	17795va		
0100	0200		Anguilla, University Network	6090am			
0100	0200		Australia, ABC NT Katherine	5025do			
0100	0200		Australia, ABC NT Tennant Creek				4910do
0100	0200		Canada, CFRX Toronto ON	6070na			
0100	0200		Canada, CFVP Calgary AB	6030na			
0100	0200		Canada, CKZN St John's NF	6160na			
0100	0200		Canada, CKZU Vancouver BC				6160na
0100	0200		China, China Radio Intl	6020na	9470eu		
				9535as	9570na	9580na	9725eu
				9790na	11870as	15115as	15785as
0100	0200		Costa Rica, University Network				5030va
				6150va	7375va	9725va	
0100	0200		Cuba, Radio Havana	6000na	6180na		
0100	0200		Guyana, Voice of	3291do			
0100	0200		Indonesia, Voice of		9525as	11785pa	
				15150al			
0100	0200		Malaysia, RTM/Trax FM	7295as			
0100	0200		Netherlands, Radio	9845na			
0100	0200		New Zealand, Radio NZ Intl	15720pa			
0100	0200	DRM	New Zealand, Radio NZ Intl	13730pa			
0100	0200		North Korea, Voice of Korea	7140as	9345as		
				9730as	11735ca	13760ca	15180ca
0100	0200	vl	Papua New Guinea, Wantok R. Light		7325va		
0100	0200		Russia, Voice of	7250na	9665na	12775na	
0100	0200		Singapore, MediaCorp Radio	6150do			
0100	0200		Sri Lanka, SLBC	6005as	9770as	15745as	
0100	0200		Taiwan, Radio Taiwan Intl	11875as	15465na		
0100	0200		UK, BBC World Service	6195as	9410as		
				9580as	11750as	11955as	15310as
				15335as	15360as		
0100	0200	f	UK, Bible Voice BC	6140as			
0100	0200		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
0100	0200		USA, KAIJ Dallas TX	5755va			
0100	0200		USA, KTBN Salt Lake City UT	7505na			
0100	0200		USA, KWHR Naalehu HI	17655as			
0100	0200		USA, Voice of America	7430va	9780va		
				11705va			
0100	0200	Sun	USA, WBCQ Monticello ME	9330am			
0100	0200		USA, WBCQ Monticello ME	5110am	7415na		
				9330na			
0100	0200		USA, WBOH Newport NC	5920am			
0100	0200		USA, WEWN Vandiver AL	5810na			
0100	0200		USA, WHRA Greenbush ME	5890na			
0100	0200		USA, WHRI Cypress Creek SC				5850am
				7315am	7490am		
0100	0200		USA, WINB Red Lion PA	9265am			
0100	0200	sm	USA, WRMI Miami FL	9955va			
0100	0200	twhfa	USA, WRMI Miami FL	7385na			
0100	0200		USA, WTJC Newport NC	9370na			
0100	0200		USA, WWCR Nashville TN	3215na	5070na		
				7465na	13845na		
0100	0200	mtwhfa	USA, WWRB Manchester TN	5745am			
0100	0200		USA, WWRB Manchester TN	3185va	5050va		
				6890va			
0100	0200		USA, WYFR/Family Radio FL	6065na	9595am		
0100	0200		Uzbekistan, CVC International				11790as
0105	0128	Sun/Mon	Austria, Radio Austria Intl	9870am			
0113	0128	twhfa	Austria, Radio Austria Intl	9870am			
0115	0130	Sat	Australia, HCJB Global	15405va			
0130	0200		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15415as	17715as
				17795va			
0130	0200		Iran, Voice of the Islamic Rep	7235na	9495na		
0130	0200		Sweden, Radio	6010na	11675va		
0130	0200	twhfa	USA, Voice of America	6040na	13740am		
0140	0200		Vatican City, Vatican Radio	5915va	7335va		
0143	0158	twhfa	Austria, Radio Austria Intl	9870am			

0200 UTC - 9PM EST / 8PM CST / 6PM PST

Start	Stop		Station	Freq1	Freq2	Freq3	Freq4
0200	0215		Croatia, Croatian Radio	6165na	9925eu		
0200	0230		Iran, Voice of the Islamic Rep	7235na	9495na		
0200	0230		South Korea, KBS World Radio		15575sa		
0200	0245		USA, WYFR/Family Radio FL	11835na			
0200	0258	DRM	New Zealand, Radio NZ Intl	13730pa			
0200	0300		Anguilla, University Network	6090am			
0200	0300	twhfa	Argentina, RAE	11710am			
0200	0300		Australia, ABC NT Alice Springs				2310do
				4835do			
0200	0300		Australia, ABC NT Katherine	5025do			
0200	0300		Australia, ABC NT Tennant Creek				4910do
0200	0300		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15415as	15515as

			21725va		
0200	0300		Bulgaria, Radio 9700na	11700na	
0200	0300		Canada, CFRX Toronto ON	6070na	
0200	0300		Canada, CFVP Calgary AB	6030na	
0200	0300		Canada, CKZN St John's NF	6160na	
0200	0300		Canada, CKZU Vancouver BC		6160na
0200	0300		China, China Radio Intl 11770as	13640as	
0200	0300		Costa Rica, University Network		5030va
			6150va 7375va	9725va	
0200	0300		Cuba, Radio Havana 6000na	6180na	
0200	0300		Egypt, Radio Cairo 7270na		
0200	0300		Guyana, Voice of 3291do		
0200	0300		Malaysia, RTM/Trax FM 7295as		
0200	0300	DRM	Netherlands, Radio 9405va		
0200	0300		New Zealand, Radio NZ Intl 15720pa		
0200	0300		North Korea, Voice of Korea 13650as	15100as	
0200	0300	vl	Papua New Guinea, Wantok R. Light 7325va		
0200	0300		Philippines, Radio Pilipinas 11880va	15285va	
			15510va		
0200	0300		Russia, Voice of 9665na 9860na	13635na	
			13775na		
0200	0300		Singapore, MediaCorp Radio 6150do		
0200	0300		Sri Lanka, SLBC 6005as 9770as	15745as	
0200	0300		Taiwan, Radio Taiwan Intl 5950na	9680am	
0200	0300		Thailand, Radio 5890na		
0200	0300		UK, BBC World Service 6030af	6195as	
			11750as 11955as 15310as	15335as	
			15360as 17790as		
0200	0300		USA, American Forces Radio 4319usb	5446usb	
			5765usb 6350usb 7811usb	10320usb	
			12133usb 13362usb		
0200	0300		USA, KAIJ Dallas TX 5755va		
0200	0300		USA, KJES Vado NM 7555na		
0200	0300		USA, KJES Vado NM 7555na		
0200	0300		USA, KTBN Salt Lake City UT 7505na		
0200	0300		USA, KWHR Naalehu HI 17655as		
0200	0300		USA, WBCQ Monticello ME 5110am	7415na	
			9330na		
0200	0300	Sun	USA, WBCQ Monticello ME 9330am		
0200	0300		USA, WBOH Newport NC 5920am		
0200	0300		USA, WEWN Vandiver AL 5810na		
0200	0300		USA, WHRA Greenbush ME 5890na		
0200	0300		USA, WHRI Cypress Creek SC		5850am
			7315am		
0200	0300		USA, WINB Red Lion PA 9265am		
0200	0300	sm	USA, WRMI Miami FL 9955va		
0200	0300	twhfa	USA, WRMI Miami FL 7385va		
0200	0300		USA, WTJC Newport NC 9370na		
0200	0300		USA, WWCR Nashville TN 3215na	5070na	
			5935na		
0200	0300	mtwhfa	USA, WWRB Manchester TN 5745am		
0200	0300		USA, WWRB Manchester TN 3185va	5050va	
			6890va		
0200	0300		USA, WYFR/Family Radio FL 5985am	11855am	
0200	0300		Uzbekistan, CVC International	11790as	
0215	0230		Nepal, Radio 3230as 5005as	6100as	
			7165as		
0230	0300		South Korea, KBS World Radio	9560na	
0230	0300		Sweden, Radio 6010na		
0245	0300	twhfas	Albania, Radio Tirana 6110na	7425na	
0245	0300		India, All India Radio 7420as		
0245	0300		Myanmar, Radio 9730do		
0250	0300		Vatican City, Vatican Radio 6040va	7305va	
0255	0300	vl	Rwanda, Radio 6055do		
0259	0300	DRM	New Zealand, Radio NZ Intl 11675pa		

0300 UTC - 10PM EST / 9PM CST / 7PM PST

0300	0320		Vatican City, Vatican Radio 6040va	7305va	
			15560va		
0300	0327		Czech Rep, Radio Prague 7345na	9870na	
0300	0330		Egypt, Radio Cairo 7270na		
0300	0330		Myanmar, Radio 9730do		
0300	0330		Philippines, Radio Pilipinas 11880va	15285va	
			15510va		
0300	0330		USA, KJES Vado NM 7555na		
0300	0330		USA, Voice of America 4930af	6080af	
			7340af 9885af 12080af	15580af	
0300	0330	Sun	USA, WBCQ Monticello ME 9330am		
0300	0330		Vatican City, Vatican Radio 9660af		
0300	0355		South Africa, Channel Africa 5960af		
0300	0356		Romania, Radio Romania Intl 6150va	9645na	
			11895va 15220va		
0300	0359		South Africa, Channel Africa 3345af		
0300	0400		Anguilla, University Network 6090am		
0300	0400		Australia, ABC NT Alice Springs		2310do
			4835do		
0300	0400		Australia, ABC NT Katherine 5025do		
0300	0400		Australia, ABC NT Tennant Creek		4910do
0300	0400		Australia, Radio Australia 9660as	12080as	

			13690as 15240pa 15415as	15515as	
			21725va		
0300	0400	twhfas	Canada, CBC NQ SW Service 9625na		
0300	0400		Canada, CFRX Toronto ON	6070na	
0300	0400		Canada, CFVP Calgary AB	6030na	
0300	0400		Canada, CKZN St John's NF	6160na	
0300	0400		Canada, CKZU Vancouver BC		6160na
0300	0400		China, China Radio Intl 9690na	9790na	
			11770as 15110as 15120as	15785as	
0300	0400		Costa Rica, University Network		5030va
			6150va 7375va	9725va	
0300	0400		Cuba, Radio Havana 6000na	6180na	
0300	0400		Germany, Deutsche Welle 11695as	13810as	
0300	0400		Guyana, Voice of 3291do		
0300	0400		Malaysia, RTM/Trax FM 7295as		
0300	0400		Malaysia, RTM/Voice of Malaysia		6175as
			9750as 15295as		
0300	0400		New Zealand, Radio NZ Intl 15720pa		
0300	0400	DRM	New Zealand, Radio NZ Intl 11675pa		
0300	0400		North Korea, Voice of Korea 7140as	9345as	
			9730as		
0300	0400		Oman, Radio Oman 15355as		
0300	0400	vl	Papua New Guinea, Wantok R. Light 7325va		
0300	0400		Russia, Voice of 5990na 9435na	9515na	
			9665na 9860na 12065na	13635na	
0300	0400	vl	Rwanda, Radio 6055do		
0300	0400		Singapore, MediaCorp Radio 6150do		
0300	0400		Sri Lanka, SLBC 6005as 9770as	15745as	
0300	0400		Taiwan, Radio Taiwan Intl 5950am	15215sa	
0300	0400		Turkey, Voice of 5975va		
0300	0400	Sun	UK, BBC World Service 11760as		
0300	0400		UK, BBC World Service 3255af	6005af	
			6030af 6190af 6195as	9750af	
			12035af 15310as 15360af	15575as	
			17760as 21660as		
0300	0400		Ukraine, Radio Ukraine Intl 5820na		
0300	0400		USA, American Forces Radio 4319usb	5446usb	
			5765usb 6350usb 7811usb	10320usb	
			12133usb 13362usb		
0300	0400		USA, KAIJ Dallas TX 5755va		
0300	0400		USA, KTBN Salt Lake City UT 7505na		
0300	0400		USA, KWHR Naalehu HI 17655as		
0300	0400		USA, WBCQ Monticello ME 5110am	7415na	
0300	0400		USA, WBOH Newport NC 5920am		
0300	0400		USA, WEWN Vandiver AL 5810na		
0300	0400		USA, WHRA Greenbush ME 5890na		
0300	0400	mtwhf	USA, WHRI Cypress Creek SC		5835am
0300	0400		USA, WHRI Cypress Creek SC		5850am
			7490am		
0300	0400	Sat/Sun	USA, WHRI Cypress Creek SC		7315am
0300	0400		USA, WINB Red Lion PA 9265am		
0300	0400		USA, WRMI Miami FL 9955va		
0300	0400		USA, WTJC Newport NC 9370na		
0300	0400		USA, WWCR Nashville TN 3215na	5070na	
			5935na 7465na		
0300	0400		USA, WWRB Manchester TN 3185va	5050va	
0300	0400		USA, WYFR/Family Radio FL 6065na	9505na	
			11740na 15255na		
0300	0400		Uzbekistan, CVC International	13680as	
0330	0335		Bahrain, Radio Bahrain 6010as		
0330	0345		Israel, Kol Israel 9345eu 11590va	17600va	
0330	0355		Vietnam, Voice of 6175na		
0330	0357		Czech Rep, Radio Prague 6080as	9445as	
			11600as		
0330	0400	twhfas	Albania, Radio Tirana 6110na	7425na	
0330	0400		UK, BBC World Service 15420af		
0330	0400		USA, Voice of America 4930af	6080af	
			9885af 12080af	15580af	
0330	0400	twhfas	USA, WBCQ Monticello ME 9330am		

0400 UTC - 11PM EST / 10PM CST / 8PM PST

0400	0430		Australia, Radio Australia 9660as	12080as	
			13690as 15240pa 15515as	21725va	
0400	0430	mtwhf	France, Radio France Intl 9805af	11995af	
0400	0430		Sri Lanka, SLBC 6005as 9770as	15745as	
0400	0430	Sat/Sun	USA, WWRB Manchester TN 5745am		
0400	0445		USA, WYFR/Family Radio FL 6065na	9505na	
0400	0458		New Zealand, Radio NZ Intl 15720pa		
0400	0458	DRM	New Zealand, Radio NZ Intl 11675pa		
0400	0500		Anguilla, University Network 6090am		
0400	0500		Armenia, CVC International 15515as		
0400	0500		Australia, ABC NT Alice Springs		2310do
			4835do		
0400	0500		Australia, ABC NT Katherine 5025do		
0400	0500		Australia, ABC NT Tennant Creek		4910do
0400	0500	twhfas	Canada, CBC NQ SW Service 9625na		
0400	0500		Canada, CFRX Toronto ON	6070na	
0400	0500		Canada, CKZN St John's NF	6160na	
0400	0500		Canada, CKZU Vancouver BC		6160na

Start	End	Days	Station	F1	F2	F3	F4
0400	0500		China, China Radio Intl	6020na	6080as		
				13750as	15120as	15785as	17725as
				17855as			
0400	0500		Costa Rica, University Network		5030va		
				6150va	7375va	9725va	
0400	0500		Cuba, Radio Havana	6000na	6180na		
0400	0500		Germany, Deutsche Welle	7225af	7245af		
				12045af	15445af		
0400	0500		Guyana, Voice of	3291do			
0400	0500		Malaysia, RTM/Trax FM	7295as			
0400	0500		Malaysia, RTM/Voice of Malaysia		6175as		
				9750as	15295as		
0400	0500		Netherlands, Radio	6165na			
0400	0500	vl	Papua New Guinea, Wantok R. Light	7325va			
0400	0500		Russia, Voice of	9435na	9515na	9860na	
				9880na	13635na	13775na	
0400	0500	DRM	Russia, Voice of	9435as			
0400	0500	vl	Rwanda, Radio	6055do			
0400	0500		Singapore, MediaCorp Radio	6150do			
0400	0500	vl	Uganda, Radio	4976do	5026do		
0400	0500	DRM	UK, BBC World Service	7440eu			
0400	0500		UK, BBC World Service	3255af	6005af		
				6190af	7120af	7160af	9410eu
				11760as	12035af	12095eu	15310as
				15360as	15460af	15565eu	15575as
				17760as	17790as	21660as	
0400	0500		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
0400	0500		USA, KAIJ Dallas TX	5755va			
0400	0500		USA, KTBN Salt Lake City UT	7505na			
0400	0500		USA, KWHR Naalehu HI	17655as			
0400	0500		USA, Voice of America	4930af	4960af		
				6080af	9575af	11835af	12080af
				15580af			
0400	0500		USA, WBCQ Monticello ME	5110am	7415na		
0400	0500		USA, WBOH Newport NC	5920na			
0400	0500		USA, WEWN Vandiver AL	5810na			
0400	0500		USA, WHRA Greenbush ME	5890na			
0400	0500	mtwhf	USA, WHRI Cypress Creek SC		5835am		
0400	0500	Sat/Sun	USA, WHRI Cypress Creek SC		7315am		
0400	0500		USA, WHRI Cypress Creek SC		7490am		
0400	0500		USA, WMLK Bethel PA	9265va			
0400	0500		USA, WRMI Miami FL	9955va			
0400	0500		USA, WTJC Newport NC	9370na			
0400	0500		USA, WWCR Nashville TN	3215na	5070na		
				5890na	5935na		
0400	0500		USA, WWRB Manchester TN	3185va	5050va		
				6890na			
0400	0500		USA, WYFR/Family Radio FL	6855na	7780va		
				9715am			
0400	0500		Uzbekistan, CVC International		13680as		
0430	0500		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15415as	15515va
				21725va			
0430	0500		Nigeria, Radio/Kaduna	6090do			
0430	0500		Swaziland, TWR	3200af	4775af		
0430	0500	Sat	USA, WWRB Manchester TN	5745am			
0459	0500	DRM	New Zealand, Radio NZ Intl	9890pa			

0500 UTC - 12AM EST / 11PM CST / 9PM PST

Start	End	Days	Station	F1	F2	F3	F4
0500	0507	twhfas	Canada, CBC NQ SW Service	9625na			
0500	0515	Sun	Sri Lanka, SLBC	6005as	9770as	15745as	
0500	0530		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15515as	
0500	0530	mtwhf	France, Radio France Intl	11995af	13680af		
0500	0530		Germany, Deutsche Welle	5945af	9700af		
0500	0530		Japan, NHK World/Radio Japan		5975eu		
				6110na	9725af	15325as	17810as
0500	0530		Vatican City, Vatican Radio	4005eu	7250eu		
				9660af	11625af	13765af	
0500	0555		South Africa, Channel Africa	9685af			
0500	0559		South Africa, Channel Africa	7240af			
0500	0600		Anguilla, University Network	6090am			
0500	0600		Armenia, CVC International	15515as			
0500	0600		Australia, ABC NT Alice Springs		2310do		
				4835do			
0500	0600		Australia, ABC NT Katherine	5025do			
0500	0600		Australia, ABC NT Tennant Creek		4910do		
0500	0600		Bhutan, BBS	6035as			
0500	0600		Canada, CFRX Toronto ON	6070na			
0500	0600		Canada, CKZN St John's NF	6160na			
0500	0600		Canada, CKZU Vancouver BC		6160na		
0500	0600		China, China Radio Intl	6020na	6190na		
				11710nf	11880as	15350as	15465as
				17505as	17540as	17725as	17855as
0500	0600		Costa Rica, University Network		5030va		
				6150va	7375va	9725va	
0500	0600		Cuba, Radio Havana	6000na	6060na		
				6180na	9550va	9600va	11760va
0500	0600		Germany, CVC Intl/Voice Africa		9430af		
0500	0600		Guyana, Voice of	3291do			
0500	0600		Kuwait, Radio Kuwait	15110as			
0500	0600		Malaysia, RTM/Trax FM	7295as			
0500	0600		Malaysia, RTM/Voice of Malaysia		6175as		
				9750as	15295as		
0500	0600		New Zealand, Radio NZ Intl	9615pa			
0500	0600	DRM	New Zealand, Radio NZ Intl	9890pa			
0500	0600		Nigeria, Radio/Kaduna	4770do	6090al		
0500	0600	vl	Papua New Guinea, Wantok R. Light	7325va			
0500	0600		Russia, Voice of	17635pa	21790pa		
0500	0600	DRM	Russia, Voice of	12005as			
0500	0600		Singapore, MediaCorp Radio	6150do			
0500	0600		Swaziland, TWR	3200af	4775af	9500af	
0500	0600	vl	Uganda, Radio	4976do	5026do		
0500	0600	DRM	UK, BBC World Service	7440eu			
0500	0600		UK, BBC World Service	3255af	6005af		
				6190af	6195af	7160af	9410eu
				11695af	11760as	11765af	11955as
				12095eu	15310as	15360as	15420af
				15565eu	17640af	17760as	17790as
				17885af	21660as		
0500	0600		Ukraine, Radio Ukraine Intl	7420eu			
0500	0600		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
0500	0600		USA, KAIJ Dallas TX	5755va			
0500	0600		USA, KTBN Salt Lake City UT	7505na			
0500	0600		USA, KWHR Naalehu HI	13650as			
0500	0600		USA, Voice of America	4930af	6080af		
				6180af	12080af	15580af	
0500	0600		USA, WBCQ Monticello ME	5110am	7415na		
0500	0600		USA, WBOH Newport NC	5920na			
0500	0600		USA, WEWN Vandiver AL	5850na			
0500	0600		USA, WHRA Greenbush ME	6145na			
0500	0600	Sat/Sun	USA, WHRI Cypress Creek SC		7315am		
0500	0600		USA, WMLK Bethel PA	9265va			
0500	0600		USA, WRMI Miami FL	9955va			
0500	0600		USA, WTJC Newport NC	9370na			
0500	0600		USA, WWCR Nashville TN	3215na	5070na		
				5890na	5935na		
0500	0600		USA, WWRB Manchester TN	3185va			
0500	0600		USA, WYFR/Family Radio FL	6855na	9355va		
0500	0600		Uzbekistan, CVC International		13680as		
0500	0600		Zambia, CVC International	9430af			
0505	0520	m	Austria, Radio Austria Intl	17870me			
0505	0530	Sat/Sun	Austria, Radio Austria Intl	17870me			
0515	0530	vl	Rwanda, Radio	6055do			
0530	0556		Romania, Radio Romania Intl	9655va	11830va		
				15435va	17770va		
0530	0600		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa	15415va	15515va
0530	0600	vl	Rwanda, Radio	6055do			
0530	0600		Thailand, Radio	17655eu			
0535	0600	Sat/Sun	Austria, Radio Austria Intl	17870me			
0545	0600	twhf	Austria, Radio Austria Intl	17870me			

0600 UTC - 1AM EST / 12AM CST / 10PM PST

Start	End	Days	Station	F1	F2	F3	F4
0600	0603		Croatia, Croatian Radio	6165eu	9470eu		
				11610eu			
0600	0615	Sat/Sun	South Africa, TWR	11640af			
0600	0630		Australia, Radio Australia	9660as	12080as		
				13690as	15240pa		
0600	0630	Sat/Sun	Australia, Radio Australia	15290va	15415va		
				15515va			
0600	0630	mtwhf	France, Radio France Intl	9765af	11725af		
0600	0630		Germany, Deutsche Welle	7310af	15275af		
0600	0630		Nigeria, Radio, Natl Svc/Abuja	7275do			
0600	0630	mtwhf	UK, Sudan Radio Service	15440af	15505af		
0600	0645	mtwhf	South Africa, TWR	11640af			
0600	0655		South Africa, Channel Africa	15255af			
0600	0658		New Zealand, Radio NZ Intl	9615pa			
0600	0658	DRM	New Zealand, Radio NZ Intl	9890pa			
0600	0700		Anguilla, University Network	6090am			
0600	0700		Armenia, CVC International	15515as			
0600	0700		Australia, ABC NT Alice Springs		2310do		
				4835do			
0600	0700		Australia, ABC NT Katherine	5025do			
0600	0700		Australia, ABC NT Tennant Creek		4910do		
0600	0700		Australia, CVC International	15335as			
0600	0700		Bhutan, BBS	6035as			
0600	0700		Canada, CFRX Toronto ON	6070na			
0600	0700		Canada, CFVP Calgary AB	6030na			
0600	0700		Canada, CKZN St John's NF	6160na			
0600	0700		Canada, CKZU Vancouver BC		6160na		
0600	0700		China, China Radio Intl	11710af	11870as		
				11880as	13660as	15140as	15350as
				15465as	17505as	17505as	17540as

				17710as			
0600	0700		Costa Rica, University Network	5030va			
			6150va	7375va	9725va	11870va	
0600	0700		Cuba, Radio Havana	6000va	6060va		
			6180na	9550va	9600va	11760va	
0600	0700		Germany, CVC Intl/Voice Africa	15640af			
0600	0700	mwhfas	Greece, Voice of	11645eu			
0600	0700		Guyana, Voice of 3291do				
0600	0700		Kuwait, Radio Kuwait	15110as			
0600	0700	vl	Liberia, ELWA	4760do			
0600	0700		Malaysia, RTM/Trax FM	7295as			
0600	0700		Malaysia, RTM/Voice of Malaysia	6175as			
			9750as	15295as			
0600	0700		Nigeria, Radio/Kaduna	4770do	6090al		
0600	0700	vl	Papua New Guinea, Wantok R. Light	7325va			
0600	0700		Russia, Voice of 17635pa	21790pa			
0600	0700		Singapore, MediaCorp Radio	6150do			
0600	0700	vl	Solomon Islands, SIBC	5020do	9545al		
0600	0700		Swaziland, TWR 3200af	4775af	9500af		
0600	0700	Sat/Sun	UK, BBC World Service	17885af			
0600	0700		UK, BBC World Service	3255af	6005af		
			6190af	7475eu	7475eu	9410af	
			9860as	11695as	11760as	11765as	
			11955af	12095as	15310as	15360af	
			15400af	17640as	11760as	17790af	
			21660af				
0600	0700	DRM	UK, BBC World Service	7440eu			
0600	0700		USA, American Forces Radio	4319usb	5446usb		
			5765usb	6350usb	7811usb	10320usb	
			12133usb	13362usb			
0600	0700		USA, KAIJ Dallas TX	5755va			
0600	0700		USA, KTBN Salt Lake City UT 7505na				
0600	0700		USA, KWHR Naalehu HI	13650as			
0600	0700		USA, Voice of America	6080af	6180af		
			12080af	15580af			
0600	0700		USA, WBCQ Monticello ME	5110am	7415na		
0600	0700		USA, WBOH Newport NC	5920na			
0600	0700		USA, WEWN Vandiver AL	5850na	7570eu		
0600	0700		USA, WHRA Greenbush ME	7490na			
0600	0700		USA, WHRI Cypress Creek SC		7335am		
			7365am	7490am			
0600	0700		USA, WMLK Bethel PA	9265va			
0600	0700		USA, WRMI Miami FL	9955va			
0600	0700		USA, WTJC Newport NC	9370na			
0600	0700		USA, WWCR Nashville TN	3215na	5070na		
			5890na	5935na			
0600	0700		USA, WWRB Manchester TN	3185va			
0600	0700		USA, WYFR/Family Radio FL	6000am	7780va		
			9680af	11530af	11580va		
0600	0700	vl	Vanuatu, Radio 4960do				
0600	0700		Yemen, Rep of Yemen Radio	9780me			
0600	0700		Zambia, CVC International	13650af			
0630	0645	mtwhfa	Vatican City, Vatican Radio	4005va	6185eu		
			7250eu	9645eu	11625eu	11740eu	
			13765eu	15570af	15595af		
0630	0700		Australia, Radio Australia	9660as	12080as		
			13690as	15240pa	15415as	15515as	
0630	0700		Bulgaria, Radio 9600eu	11600eu			
0630	0700		UK, BBC World Service	11990af			
0630	0700	mtwhf	UK, Sudan Radio Service	11945af			
0630	0700	mwf	UK, Sudan Radio Service	15445af			
0645	0700	Sun	Albania, TWR Europe	11865eu			
0645	0700	Sun	Monaco, TWR Europe	9800eu			
0659	0700	DRM	New Zealand, Radio NZ Intl 7145pa				

0700 UTC - 2AM EST / 1AM CST / 11PM PST

0700	0705		UK, BBC World Service	6005af			
0700	0727		Czech Rep, Radio Prague	9880eu	11600eu		
0700	0727		Slovakia, Radio Slovakia Int	9440pa	15460pa		
0700	0730		France, Radio France Intl	13675af			
0700	0745		USA, WYFR/Family Radio FL	7780va			
0700	0750	mtwhfs	Albania, TWR Europe	11865eu			
0700	0750	mtwhf	Monaco, TWR Europe	9800eu			
0700	0800		Anguilla, University Network	6090am			
0700	0800		Australia, ABC NT Alice Springs		2310do		
			4835do				
0700	0800		Australia, ABC NT Katherine 5025do				
0700	0800		Australia, ABC NT Tennant Creek		4910do		
0700	0800		Australia, CVC International	15335as			
0700	0800		Australia, Radio Australia	9660as	9710as		
			12080as	13630as	15240pa	15415as	
0700	0800		Bhutan, BBS 6035as				
0700	0800		Canada, CFRX Toronto ON	6070na			
0700	0800		Canada, CFVP Calgary AB	6030na			
0700	0800		Canada, CKZN St John's NF	6160na			
0700	0800		Canada, CKZU Vancouver BC		6160na		
0700	0800		China, China Radio Intl	11880as	13660as		
			13710as	15450as	15465eu	17490eu	
			17540as	17710as			

0700	0800		Costa Rica, University Network	5030va			
			6150va	7375va	9725va	11870va	
0700	0800		Germany, CVC Intl/Voice Africa	15640af			
0700	0800		Guyana, Voice of 3291do	5950do			
0700	0800		Kuwait, Radio Kuwait	15110as			
0700	0800	vl	Liberia, ELWA	4760do			
0700	0800		Liberia, Star Radio	9525af			
0700	0800		Malaysia, RTM/Trax FM	7295as			
0700	0800		Malaysia, RTM/Voice of Malaysia	6175as			
			9750as	15295as			
0700	0800		Myanmar, Radio 9730do				
0700	0800		New Zealand, Radio NZ Intl 6095pa				
0700	0800		New Zealand, Radio NZ Intl 6095pa				
0700	0800	DRM	New Zealand, Radio NZ Intl 7145pa				
0700	0800		Nigeria, Radio/Kaduna	4770do	6090al		
0700	0800	vl	Papua New Guinea, Wantok R. Light	7325va			
0700	0800		Russia, Voice of 17495pa	17635pa	21790pa		
0700	0800		Singapore, MediaCorp Radio	6150do			
0700	0800	vl	Solomon Islands, SIBC	5020do	9545al		
0700	0800		Swaziland, TWR 4775af	6120af	9500af		
0700	0800		Taiwan, Radio Taiwan Intl	5950am			
0700	0800	DRM	UK, BBC World Service	9470eu			
0700	0800		UK, BBC World Service	6190af	7320eu		
			9470eu	9860af	11695as	11760me	
			11765af	11955as	12095af	15310as	
			15360as	15400af	15575as	17760as	
			17830af	21660as			
0700	0800	Sat/Sun	UK, BBC World Service	17885af			
0700	0800	fas	UK, Bible Voice BC	5945eu			
0700	0800		Ukraine, Radio Ukraine Intl	7420eu			
0700	0800		USA, American Forces Radio	4319usb	5446usb		
			5765usb	6350usb	7811usb	10320usb	
			12133usb	13362usb			
0700	0800		USA, KAIJ Dallas TX	5755va			
0700	0800		USA, KTBN Salt Lake City UT 7505na				
0700	0800		USA, KWHR Naalehu HI	13650as			
0700	0800		USA, WBCQ Monticello ME	5110am	7415na		
0700	0800		USA, WBOH Newport NC	5920na			
0700	0800		USA, WEWN Vandiver AL	5850na	7570eu		
0700	0800		USA, WHRI Cypress Creek SC		7335am		
			7365am				
0700	0800		USA, WMLK Bethel PA	9265va			
0700	0800		USA, WRMI Miami FL	9955va			
0700	0800		USA, WTJC Newport NC	9370na			
0700	0800		USA, WWCR Nashville TN	3215na	5070na		
			5890na	5935na			
0700	0800		USA, WWRB Manchester TN	3185va			
0700	0800		USA, WYFR/Family Radio FL	5985na	6855na		
			9505am	9715am	9930af		
0700	0800	vl	Vanuatu, Radio 4960do				
0700	0800		Zambia, CVC International	13650af			
0715	0750	Sat	Albania, TWR Europe	11865eu			
0715	0750	Sat	Monaco, TWR Europe	9800eu			
0730	0800		Australia, HCJB Global	11750pa			
0730	0800		Pakistan, Radio 15100eu	17835eu			

0800 UTC - 3AM EST / 2AM CST / 12AM PST

0800	0815	Sat	UK, Bible Voice BC	5945eu			
0800	0820	mtwhfs	Albania, TWR Europe	11865eu			
0800	0820	mtwhfs	Monaco, TWR Europe	9800eu			
0800	0825		Malaysia, RTM/Voice of Malaysia	6175as			
			9750as	15295as			
0800	0830		Australia, ABC NT Katherine 5025do				
0800	0830		Australia, ABC NT Tennant Creek		4910do		
0800	0830		Myanmar, Radio 9730do				
0800	0830		Pakistan, Radio 15100eu	17835eu			
0800	0845	Sat	Guam, TWR/KTWR	11840pa			
0800	0845	Sun	UK, Bible Voice BC	5945eu			
0800	0845		USA, WYFR/Family Radio FL 9930af				
0800	0900		Anguilla, University Network	6090am			
0800	0900		Australia, ABC NT Alice Springs		2310do		
			4835do				
0800	0900		Australia, CVC International	15335as			
0800	0900		Australia, HCJB Global	11750pa			
0800	0900		Australia, Radio Australia	9580as	9590va		
			9710as	12080va	13630as	15415as	
0800	0900		Canada, CFRX Toronto ON	6070na			
0800	0900		Canada, CFVP Calgary AB	6030na			
0800	0900		Canada, CKZN St John's NF	6160na			
0800	0900		Canada, CKZU Vancouver BC		6160na		
0800	0900		China, China Radio Intl	11620as	11880as		
			13710as	15350as	15465as	17490eu	
			17540as				
0800	0900		Costa Rica, University Network	5030va			
			6150va	9725va	11870va		
0800	0900		Germany, CVC Intl/Voice Africa	15640af			
0800	0900	vl	Greece, Voice of 9420eu	15630eu			
0800	0900	mtwhf	Guam, TWR/KTWR	11840pa			
0800	0900		Guyana, Voice of 3291do	5950do			

0800	0900		Indonesia, Voice of	9525as	11785pa
			15150al		
0800	0900	Sat	Latvia, Radio SWH	9290eu	
0800	0900	vl	Liberia, ELWA 4760do		
0800	0900		Malaysia, RTM/Trax FM	7295as	
0800	0900		New Zealand, Radio NZ Intl	6095pa	
0800	0900	DRM	New Zealand, Radio NZ Intl	7145pa	
0800	0900		Nigeria, Radio/Kaduna	4770do	6090al
0800	0900		Nigeria, Voice of/Ext. Svc Lagos	9690af	
0800	0900		Papua New Guinea, NBC	4890do	
0800	0900	vl	Papua New Guinea, Wantok R. Light	7325va	
0800	0900		Russia, Voice of 17495pa	17635pa	21790pa
0800	0900	DRM	Russia, Voice of 12070as	15780eu	
0800	0900		Singapore, MediaCorp Radio	6150do	
0800	0900	vl	Solomon Islands, SIBC	5020do	9545al
0800	0900		South Africa, Channel Africa	9620af	
0800	0900	Sun	South Africa, DX Amateur League	17590af	
0800	0900		South Korea, KBS World Radio	9570as	
0800	0900		Swaziland, TWR 4775af	6120af	9500af
0800	0900		Taiwan, Radio Taiwan Intl	11715pa	
0800	0900	DRM	UK, BBC World Service	9480eu	
0800	0900		UK, BBC World Service	6190af	7320eu
			9470eu 9740as	9860af	11760me
			15310as 15360as	15400af	15485af
			17760as 17790as	17830af	17885af
			21470af 21660as		
0800	0900	Sat/Sun	UK, BBC World Service	6195as	15575as
0800	0900		USA, American Forces Radio	4319usb	5446usb
			5765usb 6350usb	7811usb	10320usb
			12133usb 13362usb		
0800	0900		USA, KAIJ Dallas TX	5755va	
0800	0900		USA, KNLS Anchor Point AK	7355as	
0800	0900		USA, KTBN Salt Lake City UT	7505na	
0800	0900		USA, KWHR Naalehu HI	9930as	
0800	0900		USA, WBOH Newport NC	5920am	
0800	0900		USA, WEWN Vandiver AL	5850na	7570eu
0800	0900		USA, WHRI Cypress Creek SC		7315am
			7335am		
0800	0900		USA, WMLK Bethel PA	9265va	
0800	0900		USA, WRMI Miami FL	9955va	
0800	0900		USA, WTJC Newport NC	9370va	
0800	0900		USA, WWCR Nashville TN	3215na	5070na
			5890na 5935na		
0800	0900		USA, WWRB Manchester TN	3185va	
0800	0900		USA, WYFR/Family Radio FL	5985na	6855na
0800	0900	vl	Vanuatu, Radio 4960do		
0800	0900		Zambia, CVC International	13650af	
0805	0900	mtwhf	Guam, TWR/KTWR	15170as	
0815	0845	Sat	UK, Bible Voice BC	9655eu	
0830	0900		Australia, ABC NT Katherine	2485do	
0830	0900		Australia, ABC NT Tennant Creek		2325do
0830	0900		Lithuania, Radio Vilnius	9710eu	

0900 UTC - 4AM EST / 3AM CST / 1AM PST

0900	0900		USA, WBCQ Monticello ME	5110am	7415na
0900	0927		Czech Rep, Radio Prague	9800eu	21745as
0900	0930		Australia, HCJB Global	11750pa	
0900	0930		Japan, NHK World/Radio Japan		9825as
			11890pa 15590as		
0900	1000		Anguilla, University Network	6090am	
0900	1000		Australia, ABC NT Alice Springs		2310do
			4835do		
0900	1000		Australia, ABC NT Katherine	2485do	
0900	1000		Australia, ABC NT Tennant Creek		2325do
0900	1000		Australia, CVC International	11955as	
0900	1000		Australia, Radio Australia	9580va	9590va
			11880as 15415as		
0900	1000		Bhutan, BBS 6035as		
0900	1000		Canada, CFRX Toronto ON	6070na	
0900	1000		Canada, CFVP Calgary AB	6030na	
0900	1000		Canada, CKZN St John's NF	6160na	
0900	1000		Canada, CKZU Vancouver BC		6160na
0900	1000		China, China Radio Intl	11620as	15210pa
			15350as 17490eu	17690pa	17750as
0900	1000		Costa Rica, University Network		5030va
			6150va 7375va 9725va	11870va	
			13750va		
0900	1000		Germany, Deutsche Welle	15340as	17705as
0900	1000	vl/Sun	Greece, Voice of 9420eu	15630eu	
0900	1000		Guyana, Voice of 3291do	5950do	
0900	1000	vl	Liberia, ELWA 4760do		
0900	1000		Malaysia, RTM/Trax FM	7295as	
0900	1000		New Zealand, Radio NZ Intl	6095pa	
0900	1000	DRM	New Zealand, Radio NZ Intl	7145pa	
0900	1000		Nigeria, Radio/Kaduna	4770do	6090al
0900	1000		Nigeria, Voice of/ Ext. Svc Lagos	9690af	
0900	1000		Papua New Guinea, NBC	4890do	
0900	1000	vl	Papua New Guinea, Wantok R. Light	7325va	
0900	1000		Saudi Arabia, BSKSA	15250af	

0900	1000		Singapore, MediaCorp Radio	6150do	
0900	1000	vl	Solomon Islands, SIBC	5020do	9545al
0900	1000		South Africa, Channel Africa	9620af	
0900	1000	DRM	UK, BBC World Service	9480eu	
0900	1000	smtwhf	UK, BBC World Service	9605eu	
0900	1000		UK, BBC World Service	6190af	6195as
			7320eu 9470eu	9740eu	9860af
			11760me 15310as	15360as	15400af
			15575as 17760as	17830af	17885af
			21470af		
0900	1000		USA, American Forces Radio	4319usb	5446usb
			5765usb 6350usb	7811usb	10320usb
			12133usb 13362usb		
0900	1000		USA, KAIJ Dallas TX	5755va	
0900	1000		USA, KTBN Salt Lake City UT	7505na	
0900	1000		USA, KWHR Naalehu HI	9930as	
0900	1000		USA, WBCQ Monticello ME	5110am	7415na
0900	1000		USA, WBOH Newport NC	5920am	
0900	1000		USA, WEWN Vandiver AL	5850na	
0900	1000		USA, WHRI Cypress Creek SC		7315am
			7335am		
0900	1000		USA, WRMI Miami FL	9955va	
0900	1000		USA, WTJC Newport NC	9370na	
0900	1000		USA, WWCR Nashville TN	5070na	5890na
			5935na 9985na		
0900	1000		USA, WWRB Manchester TN	3185va	
0900	1000		USA, WYFR/Family Radio FL	5985na	6885na
			9450va 9755am		
0900	1000	vl	Vanuatu, Radio 4960do		
0900	1000		Zambia, CVC International	13650af	
0930	0945		Israel, Kol Israel 13855eu	15760eu	
0930	1000	Sun	Italy, IRRS 9510eu		

1000 UTC - 5AM EST / 4AM CST / 2AM PST

1000	1003	mtwhf	Croatia, Croatian Radio	9830pa	
1000	1030		Mongolia, Voice of	12085va	
1000	1030		UK, BBC World Service	9605as	21660as
1000	1058		New Zealand, Radio NZ Intl	6095pa	
1000	1100		Anguilla, University Network	11775am	
1000	1100		Australia, ABC NT Alice Springs		2310do
			4835do		
1000	1100		Australia, ABC NT Katherine	2485do	
1000	1100		Australia, ABC NT Tennant Creek		2325do
1000	1100		Australia, CVC International	11955as	
1000	1100	DRM	Australia, CVC International	9760eu	
1000	1100		Australia, HCJB Global	15540va	
1000	1100		Australia, Radio Australia	9580va	9590va
			11880as 12080va	15415as	
1000	1100	DRM	Austria, CVC International	11815eu	
1000	1100		Canada, CFRX Toronto ON	6070na	
1000	1100		Canada, CFVP Calgary AB	6030na	
1000	1100		Canada, CKZN St John's NF	6160na	
1000	1100		Canada, CKZU Vancouver BC		6160na
1000	1100		China, China Radio Intl	6040as	11610as
			11635as 13590as	13620as	13720as
			15190as 15210as	15350eu	17490as
			17690as		
1000	1100		Costa Rica, University Network		5030va
			6150va 7375va 9725va	11870va	
			13750va		
1000	1100		Guyana, Voice of 3291do	5950do	
1000	1100		India, All India Radio	7270as	13695va
			15020as 15260as	15410as	17510pa
			17800as 17895pa		
1000	1100	Sun	Italy, IRRS 9510eu		
1000	1100	vl	Liberia, ELWA 4760do		
1000	1100		Malaysia, RTM/Trax FM	7295as	
1000	1100		Netherlands, Radio	13710as	12065as
			13820as		
1000	1100	DRM	New Zealand, Radio NZ Intl	7145pa	
1000	1100		Nigeria, Radio/Kaduna	4770do	6090al
1000	1100		Nigeria, Voice of/ Ext. Svc Lagos	9690af	
1000	1100		North Korea, Voice of Korea	11710am	11735as
			13650as		
1000	1100		Papua New Guinea, NBC	4890do	
1000	1100	vl	Papua New Guinea, Wantok R. Light		7325va
1000	1100		Saudi Arabia, BSKSA	15250af	
1000	1100		Singapore, MediaCorp Radio	6150do	
1000	1100	vl	Solomon Islands, SIBC	5020do	9545al
1000	1100		South Africa, Channel Africa	9620af	
1000	1100		UK, BBC World Service	6190af	6195as
			7320eu 9470eu	9740as	9860af
			11760me 15310as	15575as	17760as
			17790as 17885af	21470af	
1000	1100	Sat/Sun	UK, BBC World Service	15400af	
1000	1100		USA, American Forces Radio	4319usb	5446usb
			5765usb 6350usb	7811usb	10320usb
			12133usb 13362usb		
1000	1100		USA, KAIJ Dallas TX	5755va	

Start	Stop	Days	Station	Frequencies
1000	1100		USA, KNLS Anchor Point AK	6890as 7355al
1000	1100		USA, KTBN Salt Lake City UT	7505na
1000	1100		USA, KWHR Naalehu HI	9930as
1000	1100		USA, WBCQ Monticello ME	5110am 7415na
1000	1100		USA, WBOH Newport NC	5920am
1000	1100		USA, WEWN Vandiver AL	5850na
1000	1100		USA, WHRI Cypress Creek SC	7315am 7335am
1000	1100		USA, WRMI Miami FL	9955va
1000	1100		USA, WTJC Newport NC	9370na
1000	1100		USA, WWCR Nashville TN	5070na 5890na 9985na 15825na
1000	1100		USA, WWRB Manchester TN	3185va
1000	1100		USA, WYFR/Family Radio FL	5950na 5985na 6855na 7855am 9450va 9755am
1000	1100		Zambia, CVC International	13590af
1015	1045	Sun	UK, Bible Voice BC	5910as
1030	1057		Czech Rep, Radio Prague	9880eu 11665eu
1030	1058		Vietnam, Voice of	7285as
1030	1100		Iran, Voice of the Islamic Rep	15600as 17660as
1030	1100		UK, BBC World Service	9605as 11945as 15285as 15360as 21660as
1059	1100		New Zealand, Radio NZ Intl	9870pa

1100 UTC - 6AM EST / 5AM CST / 3AM PST

Start	Stop	Days	Station	Frequencies
1100	1105		Pakistan, Radio	15100eu 17835eu
1100	1115	Sun	UK, Bible Voice BC	5945as
1100	1128		Vietnam, Voice of 9840as	7220as 7285as
1100	1130		Australia, HCJB Global	15540va
1100	1130		Iran, Voice of the Islamic Rep	15600as 17600as
1100	1145		USA, WYFR/Family Radio FL	9550na 9755am
1100	1158	DRM	New Zealand, Radio NZ Intl	7145pa
1100	1200		Anguilla, University Network	11775am
1100	1200		Australia, ABC NT Alice Springs	2310do 4835do
1100	1200		Australia, ABC NT Katherine	2485do
1100	1200		Australia, ABC NT Tennant Creek	2325do
1100	1200		Australia, CVC International	13635as
1100	1200	DRM	Australia, Radio Australia	12080va
1100	1200		Australia, Radio Australia	5995va 6020va 9475as 9560pa 9580va 9590va 11880va
1100	1200	Sat/Sun	Canada, CBC NQ SW Service	9625na
1100	1200		Canada, CFRX Toronto ON	6070na
1100	1200		Canada, CFVP Calgary AB	6030na
1100	1200		Canada, CKZN St John's NF	6160na
1100	1200		Canada, CKZU Vancouver BC	6160na
1100	1200		China, China Radio Intl	5955as 6040na 11650as 11750na 11795as 13590as 13645as 13650eu 13720as 17490eu
1100	1200		Costa Rica, University Network	5030va 6150va 7375va 9725va 11870va 13750va
1100	1200	Sun	Italy, IRRS	9510eu
1100	1200	vl	Liberia, ELWA	4760do
1100	1200		Malaysia, RTM/Trax FM	7295as
1100	1200		Netherlands, Radio	11675na
1100	1200		New Zealand, Radio NZ Intl	9870pa
1100	1200		Nigeria, Radio/Kaduna	4770do 6090al
1100	1200		Nigeria, Voice of/ Ext. Svc Lagos	9690af
1100	1200		Papua New Guinea, NBC	4890do
1100	1200	vl	Papua New Guinea, Wantok R. Light	7325va
1100	1200		Saudi Arabia, BSKSA	15250af
1100	1200		Singapore, Radio Singapore Intl	6080as 6150as
1100	1200		South Africa, Channel Africa	9620af
1100	1200		Taiwan, Radio Taiwan Intl	11715as
1100	1200	Sat/Sun	UK, BBC World Service	9660am 15400af 15575as
1100	1200		UK, BBC World Service	6190af 6195as 7320eu 9465sa 9470eu 9660am 9740as 9860va 11675va 11760me 15310as 17760as 17790as 17885af 21470af
1100	1200	mtwhf	UK, BBC World Service	15575as 17830af
1100	1200	Sat	UK, Bible Voice BC	5945as
1100	1200		Ukraine, Radio Ukraine Intl	9950eu
1100	1200		USA, American Forces Radio	4319usb 5446usb 5765usb 6350usb 7811usb 10320usb 12133usb 13362usb
1100	1200		USA, KAIJ Dallas TX	5755va
1100	1200		USA, KTBN Salt Lake City UT	7505na
1100	1200		USA, KWHR Naalehu HI	9930as
1100	1200		USA, WBOH Newport NC	5920am
1100	1200		USA, WEWN Vandiver AL	5850na
1100	1200		USA, WINB Red Lion PA	9265am
1100	1200		USA, WRMI Miami FL	9955va
1100	1200		USA, WTJC Newport NC	9370na
1100	1200		USA, WWCR Nashville TN	5070na 5890na 9985na 15825na
1100	1200		USA, WWRB Manchester TN	3185va
1100	1200		USA, WYFR/Family Radio FL	5985na 7780am 9625am
1100	1200	DRM	Vatican City, Vatican Radio	11630na
1100	1200		Zambia, CVC International	13590af
1115	1130	twhf	UK, Bible Voice BC	5945as
1115	1200	m	UK, Bible Voice BC	5945as
1130	1145		UK, BBC World Service	7135as 11920as
1130	1200		Australia, HCJB Global	15400va
1130	1200	mtwhfa	Australia, HCJB Global	15425as
1130	1200		Bulgaria, Radio	11700eu 15700eu
1130	1200		Guam, AWR/KSDA	15435as
1130	1200	mtwhf	UK, BBC World Service	9660am
1130	1200		Vatican City, Vatican Radio	15595va 17765va

1200 UTC - 7AM EST / 6AM CST / 4AM PST

Start	Stop	Days	Station	Frequencies
1200	1215	vl	UK, Bible Voice BC	5945as
1200	1230	Sun	Australia, HCJB Global	15425va
1200	1230		France, Radio France Intl	21620af
1200	1230		Japan, NHK World/Radio Japan	6120na 9625pa 13660as 17600eu
1200	1230	DRM	UK, Bible Voice BC	5945eu
1200	1245		USA, WYFR/Family Radio FL	5950na 5985na
1200	1256		Romania, Radio Romania Intl	11875eu 15220eu
1200	1258		New Zealand, Radio NZ Intl	9870pa
1200	1259		Canada, Radio Canada Intl	9660as 15170as
1200	1300		Anguilla, University Network	11775am
1200	1300		Australia, ABC NT Alice Springs	2310do 4835do
1200	1300		Australia, ABC NT Katherine	2485do
1200	1300		Australia, ABC NT Tennant Creek	2325do
1200	1300		Australia, CVC International	13635as
1200	1300		Australia, Radio Australia	5995va 6020va 9475as 9560pa 9580va 9590va 11880va
1200	1300	Sat/Sun	Canada, CBC NQ SW Service	9625na
1200	1300		Canada, CFRX Toronto ON	6070na
1200	1300		Canada, CFVP Calgary AB	6030na
1200	1300		Canada, CKZN St John's NF	6160na
1200	1300		Canada, CKZU Vancouver BC	6160na
1200	1300		China, China Radio Intl	5955as 9460as 9730as 9760pa 11650as 11660as 11690as 11760pa 11980as 13645as 13650eu 13790eu 17490eu
1200	1300		Costa Rica, University Network	9725va 11870va 13750va
1200	1300	vl	Germany, AWR Europe	15435as
1200	1300		Malaysia, RTM/Trax FM	7295as
1200	1300	DRM	New Zealand, Radio NZ Intl	7145pa
1200	1300		Nigeria, Radio/Kaduna	4770do 6090al
1200	1300		Nigeria, Voice of/ Ext. Svc Lagos	9690af
1200	1300		Papua New Guinea, NBC	4890do
1200	1300	vl	Papua New Guinea, Wantok R. Light	7325va
1200	1300		Poland, Radio Polonia	9525eu 11850eu
1200	1300		Singapore, Radio Singapore Intl	6080as 6150as
1200	1300		South Korea, KBS World Radio	9650na
1200	1300		UAE, AWR Africa	15140as
1200	1300		UK, BBC World Service	6190af 6195as 7320eu 9465sa 9470eu 9660am 9740as 9860va 11675va 11750as 11760me 15310as 15575as 17790af 17885af 21470af
1200	1300	mtwhf	UK, BBC World Service	17830af
1200	1300		USA, American Forces Radio	4319usb 5446usb 5765usb 6350usb 7811usb 10320usb 12133usb 13362usb
1200	1300		USA, KAIJ Dallas TX	9480va
1200	1300		USA, KNLS Anchor Point AK	9780as 9920al
1200	1300		USA, KTBN Salt Lake City UT	7505na
1200	1300		USA, KWHR Naalehu HI	12130as
1200	1300		USA, Voice of America	6140va 9645va 9760va 11860as 12075va
1200	1300		USA, WBOH Newport NC	5920am
1200	1300		USA, WEWN Vandiver AL	5850na
1200	1300		USA, WHRA Greenbush ME	17650na
1200	1300		USA, WHRI Cypress Creek SC	9495am 17650am
1200	1300		USA, WINB Red Lion PA	9265am
1200	1300		USA, WRMI Miami FL	9955va
1200	1300		USA, WTJC Newport NC	9370na
1200	1300		USA, WWCR Nashville TN	5890na 9985na 13845na 15825na
1200	1300		USA, WWRB Manchester TN	3185va
1200	1300		USA, WYFR/Family Radio FL	17555am 17750am
1200	1300		Zambia, CVC International	13590af
1205	1220	m	Austria, Radio Austria Intl	6155va 13730va 17715va

Start	Stop	Days	Station	F1	F2	F3	F4
1205	1230	Sat/Sun	Austria, Radio Austria Intl	6155va	13730va		
				17715va			
1215	1230	twhf	Austria, Radio Austria Intl	17715va			
1215	1300		Egypt, Radio Cairo	17835as			
1230	1258		Vietnam, Voice of	9840as	12020as		
1230	1300		Bangladesh, Bangla Betar	7185as			
1230	1300		Sweden, Radio	13580va	15240na	15735va	
1230	1300		Thailand, Radio	9835va			
1230	1300		Turkey, Voice of	13685eu	15450eu		
1235	1300	Sat/Sun	Austria, Radio Austria Intl	6155va	13730va		
				17715va			
1245	1300	Sat	Australia, HCJB Global	15425va			
1245	1300	twhf	Austria, Radio Austria Intl	6155va	13730va		
				17715va			
1245	1300	m	Austria, Radio Austria Intl	17715va			

1300 UTC - 8AM EST / 7AM CST / 5AM PST

Start	Stop	Days	Station	F1	F2	F3	F4
1300	1327		Czech Rep, Radio Prague	13580eu	17540as		
1300	1328		Serbia, International Radio Serbia	7240eu			
1300	1330		Egypt, Radio Cairo	17835as			
1300	1330		Germany, Universal Life	15750as			
1300	1330	Sun	Italy, IRRS	15750as			
1300	1330		Turkey, Voice of	13685eu	15450eu		
1300	1400		Anguilla, University Network	11775am			
1300	1400		Armenia, CVC International	15615as			
1300	1400		Australia, CVC International	13635as			
1300	1400		Australia, Radio Australia	6020va	9560as		
				9580va	9590va		
1300	1400	DRM	Australia, Radio Australia	5995va			
1300	1400	Sat/Sun	Canada, CBC NQ SW Service	9625na			
1300	1400		Canada, CFRX Toronto ON	6070na			
1300	1400		Canada, CFVP Calgary AB	6030na			
1300	1400		Canada, CKZN St John's NF	6160na			
1300	1400		Canada, CKZU Vancouver BC		6160na		
1300	1400		China, China Radio Intl	5955as	9570na		
				9650as	9730as	9760pa	9765as
				9870as	11660as	11760pa	11980as
				13610eu	13755as	13790eu	15260na
				17625sa			
1300	1400		Costa Rica, University Network				9725va
				11870va	13750va		
1300	1400		Germany, Overcomer Ministries	6110na			
1300	1400	vl/Sat	Greece, Voice of	9420eu	15630eu		
1300	1400	Sun	Latvia, Radio SWH	9290eu			
1300	1400		Malaysia, RTM/Trax FM	7295as			
1300	1400		New Zealand, Radio NZ Intl	6095pa			
1300	1400		Nigeria, Radio/Kaduna	4770do	6090al		
1300	1400		Nigeria, Voice of/ Ext. Svc Lagos		9690af		
1300	1400		North Korea, Voice of Korea	9335na	11710na		
				13650as	15180ca		
1300	1400		Papua New Guinea, NBC	4890do			
1300	1400	vl	Papua New Guinea, Wantok R. Light	7325va			
1300	1400		Singapore, Radio Singapore Intl		6080as		
				6150as			
1300	1400		South Korea, KBS World Radio		9570na		
				9770as			
1300	1400		UK, BBC World Service	6190af	6195as		
				7320eu	9740as	9860af	11750as
				11760me	15310as	15420af	17790as
				17885af	21470af		
1300	1400	Sat/Sun	UK, BBC World Service	15575as			
1300	1400	mtwhf	UK, BBC World Service	17830af			
1300	1400		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
1300	1400		USA, KAIJ Dallas TX	9480va			
1300	1400		USA, KJES Vado NM	11715na			
1300	1400		USA, KTBN Salt Lake City UT	7505na			
1300	1400		USA, KWHR Naalehu HI	12130as			
1300	1400		USA, Voice of America	9645va	9760va		
1300	1400	w f	USA, WBCQ Monticello ME	9330am			
1300	1400		USA, WBOH Newport NC	5920am			
1300	1400		USA, WEWN Vandiver AL	5850na			
1300	1400		USA, WHRA Greenbush ME	17650na			
1300	1400	mtwhf	USA, WHRI Cypress Creek SC				9495am
1300	1400		USA, WHRI Cypress Creek SC				17650am
1300	1400		USA, WINB Red Lion PA	13570am			
1300	1400		USA, WRMI Miami FL	9955va			
1300	1400		USA, WTJC Newport NC	9370na			
1300	1400		USA, WWCR Nashville TN	5890na	9985na		
				13845na	15825na		
1300	1400		USA, WWRB Manchester TN	9385na			
1300	1400		USA, WYFR/Family Radio FL	11830na	11865na		
				11895na	11910na	13810as	15670na
				17750na			
1300	1400		Zambia, CVC International	13590af			
1310	1340		Japan, NHK World/Radio Japan		11985as		

Start	Stop	Days	Station	F1	F2
1330	1357	DRM/f-a	Czech Rep, Radio Prague	9850eu	
1330	1400	DRM	Canada, Radio Canada Intl	7240eu	
1330	1400	twhfa	Guam, AWR/KSDA	15275as	
1330	1400		India, All India Radio	9690as	11620as
				13710as	
1330	1400		Laos, National Radio	7145as	
1330	1400		Sweden, Radio	15240na	15735na
1330	1400		UK, BBC World Service	7465eu	
1345	1400		Guam, TWR/KTWR	9975as	

1400 UTC - 9AM EST / 8AM CST / 6AM PST

Start	Stop	Days	Station	F1	F2	F3	F4
1400	1415	t h	Germany, Pan American BC	13645me			
1400	1415	twf	Russia, FEBA	9500eu			
1400	1430		Australia, Radio Australia	5995va	6080va		
				9590va	9625va		
1400	1430	fa	Guam, TWR/KTWR	9975as			
1400	1430	`	Japan, NHK World/Radio Japan				7200as
				11705as	11985as	13630eu	17580af
1400	1430	DRM	Romania, Radio Romania Intl	9600eu			
1400	1430		Thailand, Radio	9805va			
1400	1430	tha	UK, Sudan Radio Service	15470af			
1400	1500		Anguilla, University Network	11775am			
1400	1500		Armenia, CVC International	15615as			
1400	1500		Australia, CVC International	13635as			
1400	1500		Bhutan, BBS	6035as			
1400	1500	Sat/Sun	Canada, CBC NQ SW Service	9625na			
1400	1500		Canada, CFRX Toronto ON	6070na			
1400	1500		Canada, CFVP Calgary AB	6030na			
1400	1500		Canada, CKZN St John's NF	6160na			
1400	1500		Canada, CKZU Vancouver BC	6160na			
1400	1500		China, China Radio Intl	5955as	9560as		
				9765as	9870eu	11675as	11765as
				11775as	13610eu	13710eu	13740na
				13790eu			
1400	1500		Costa Rica, University Network				9725va
				11870va	13750va		
1400	1500	Sat	Germany, Overcomer Ministries				17810eu
1400	1500		Germany, Overcomer Ministries				6110eu
				13810va			
1400	1500	mtw	Guam, TWR/KTWR	9975as			
1400	1500		India, All India Radio	9690as	11620as		
				13710as			
1400	1500	Sun	Italy, IRRS	6125eu			
1400	1500		Jordan, Radio	11690na			
1400	1500		Libya, Voice of Africa		17775af	17870af	
				21695af	21870af		
1400	1500		Malaysia, RTM/Trax FM	7295as			
1400	1500		Netherlands, Radio	9345as	9840as		
				11835as			
1400	1500		New Zealand, Radio NZ Intl	6095pa			
1400	1500		Nigeria, Radio/Kaduna	4770do	6090al		
1400	1500		Nigeria, Voice of/ Ext. Svc Lagos		9690af		
1400	1500	vl	Papua New Guinea, Wantok R. Light	7325va			
1400	1500		Russia, Voice of	6045as	7165as	9745as	
				11755as	15695as	15660as	
1400	1500	DRM	Russia, Voice of	9450eu			
1400	1500		Singapore, MediaCorp Radio	6150do			
1400	1500		South Africa, Channel Africa	9620af			
1400	1500		Taiwan, Radio Taiwan Intl	15265as			
1400	1500	Sat	UK, BBC World Service	12095af			
1400	1500	mtwhf	UK, BBC World Service	17830af			
1400	1500		UK, BBC World Service	3255af	6190af		
				6195as	7320eu	9740as	9860af
				11750as	11920as	15310as	15575as
				21470af	21660af		
1400	1500	Sat/Sun	UK, Bible Voice BC	15680as			
1400	1500		Ukraine, Radio Ukraine Intl	5830eu			
1400	1500		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
1400	1500		USA, KAIJ Dallas TX	9480va			
1400	1500		USA, KJES Vado NM	11715na			
1400	1500		USA, KNLS Anchor Point AK	7355as			
1400	1500		USA, KTBN Salt Lake City UT	7505na	15590na		
1400	1500		USA, KWHR Naalehu HI	9930as			
1400	1500		USA, Voice of America	4930af	6080af		
				7125va	9760va	13570af	15185va
				15530va	17740va	17895va	
1400	1500		USA, WBCQ Monticello ME	9330am			
1400	1500		USA, WBOH Newport NC	5920am			
1400	1500		USA, WEWN Vandiver AL	9955na			
1400	1500		USA, WHRA Greenbush ME	17650na			
1400	1500		USA, WHRI Cypress Creek SC				9840am
				11785am	17650am		
1400	1500		USA, WINB Red Lion PA	13570am			
1400	1500		USA, WRMI Miami FL	7385na			
1400	1500		USA, WTJC Newport NC	9370na			

1400	1500		USA, WWCR Nashville TN	9985na	12160na
			13845na	15825na	
1400	1500		USA, WWRB Manchester TN	9385na	
1400	1500	Sat/Sun	USA, WYFR/Family Radio FL	15680as	
1400	1500		USA, WYFR/Family Radio FL	7320va	9865eu
			11830na	11910na	12150am 13695am
			13810va	17750am	
1400	1500		Zambia, CVC International	13590af	
1415	1430		Nepal, Radio	3230as	5005as	6100as
			7165as		
1415	1445	m	UAE, FEBA	12025eu	
1430	1445	Sun	Germany, Pan American BC	13645as	13820as
1430	1445	twf	UAE, FEBA	12025eu	
1430	1500		Australia, Radio Australia	5995va	6080va
			9475as	9590va	9625va	11660pa
1430	1500		Ethiopia, Radio	5990af	7110af	9704af
1430	1500		Myanmar, Radio	5986as	
1430	1500	DRM	South Korea, KBS World Radio	9770eu

1500 UTC - 10AM EST / 9AM CST / 7AM PST

1500	1510	mtwhfa	Turkmenistan, Turkmen Radio	5015eu	
1500	1528		Vietnam, Voice of	9550va	9840va	12020va
			13860va		
1500	1530	twhfas	Albania, Radio Tirana	13640na	
1500	1530	vl	Eritrea, Bana Radio	5100do	
1500	1530		Guam, AWR/KSDA	11640as	
1500	1530		Nigeria, Radio, Natl Svc/Abuja	7275do	
1500	1530		UK, BBC World Service	9695af	11860af
			15420af		
1500	1530	ta	UK, Bible Voice BC	13840as	
1500	1545		Sweden, IBRA Radio	7340as	
1500	1545		USA, WYFR/Family Radio FL	15770am	
1500	1550		New Zealand, Radio NZ Intl	6095pa	
1500	1555		South Africa, Channel Africa	17770af	
1500	1557		Canada, Radio Canada Intl	11675as	17720as
1500	1559		Germany, Overcomer Ministries	17815na	
1500	1559		Libya, Voice of Africa	17775af	17870af
			21695af	21870af	
1500	1559		South Africa, Channel Africa	9620af	
1500	1600		Anguilla, University Network	11775am	
1500	1600		Armenia, CVC International	15615as	
1500	1600		Australia, CVC International	13635as	
1500	1600		Australia, Radio Australia	5995va	6080va
			9475as	9590va	9625va	11660pa
1500	1600	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1500	1600		Canada, CFRX Toronto ON	6070na	
1500	1600		Canada, CFVP Calgary AB	6030na	
1500	1600		Canada, CKZN St John's NF	6160na	
1500	1600		Canada, CKZU Vancouver BC	6160na	
1500	1600		China, China Radio Intl	5955as	6100as
			7160as	7325as	9785as	9870as
			11775as	11965eu	13640eu	13685af
			13740na	17630af	
1500	1600		Costa Rica, University Network		9725va
			11870va	13750va	
1500	1600		Germany, CVC Intl/Voice Africa		15715af
1500	1600		Jordan, Radio	11690na	
1500	1600		Malaysia, RTM/Trax FM	7295as	
1500	1600		Netherlands, Radio	9345as	9890as
			11835as		
1500	1600		Nigeria, Radio/Kaduna	4770do	6090al
1500	1600		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1500	1600		North Korea, Voice of Korea	9335as	11710na
			13760eu	15245eu	
1500	1600	vl	Papua New Guinea, Wantok R. Light		7325va
1500	1600		Russia, Voice of	4965me	4975me	7370eu
			9625as	9660as	11985me	12040eu
1500	1600		Singapore, MediaCorp Radio	6150do	
1500	1600		UAE, AWR Africa	11670as	
1500	1600	Sat	UK, BBC World Service	12095af	
1500	1600	mtwhf	UK, BBC World Service	17830af	
1500	1600		UK, BBC World Service	3255af	5975as
			6190af	6195as	7320af	9740as
			9860af	11750as	11760as	11920as
			15310as	15400af	15485af	21470af
			21660af		
1500	1600		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb	
1500	1600		USA, KAIJ Dallas TX	9480va	
1500	1600		USA, KTBN Salt Lake City UT	7505na	15590na
1500	1600		USA, KWHR Naalehu HI	9930as	
1500	1600		USA, Voice of America	4930af	6080af
			7125va	9590va	9760va	12080va
			13735va	15105va	15445va	15580va
			17895af		
1500	1600		USA, WBCQ Monticello ME	9330am	

1500	1600		USA, WBOH Newport NC	5920am	
1500	1600		USA, WEWN Vandiver AL	9955na	
1500	1600		USA, WHRA Greenbush ME	17650af	
1500	1600		USA, WHRI Cypress Creek SC		9840am
			11785am		
1500	1600	Sun	USA, WHRI Cypress Creek SC	15355am	
1500	1600	mtwhfa	USA, WHRI Cypress Creek SC	17650am	
1500	1600		USA, WINB Red Lion PA	13570am	
1500	1600		USA, WRMI Miami FL	7385na	
1500	1600		USA, WTJC Newport NC	9370na	
1500	1600		USA, WWCR Nashville TN	9985na	12160na
			13845na	15825na	
1500	1600		USA, WWRB Manchester TN	9385na	
1500	1600		USA, WYFR/Family Radio FL	7320va	11830na
			11910na	15750na	17750am
1500	1600		Zambia, CVC International	15715af	
1505	1520	m	Austria, Radio Austria Intl	13775ca	
1505	1530	Sat/Sun	Austria, Radio Austria Intl	13775ca	
1505	1600	DRM	Canada, Radio Canada Intl	9800na	
1505	1600		Canada, Radio Canada Intl	9515na	
1510	1545		Swaziland, TWR	4760af	
1515	1530	twhf	Austria, Radio Austria Intl	13775ca	
1515	1600	Sat	UK, Bible Voice BC	15680as	
1515	1600	ha	USA, WYFR/Family Radio FL	15680as	
1515	1600	Wed/ vl	USA, WYFR/Family Radio FL	15680as	
1530	1545		India, All India Radio	7255as	9910as
1530	1550		Vatican City, Vatican Radio	12065va	13765va
			15235va		
1530	1600	vl	Germany, AWR Europe	15225as	
1530	1600		Iran, Voice of the Islamic Rep	7370as	9635as
1530	1600	Sun	UK, Bible Voice BC	13590me	
1530	1600	m	UK, Bible Voice BC	15680as	
1530	1600	Sun	USA, WYFR/Family Radio FL	13590af	
1530	1600	Mon	USA, WYFR/Family Radio FL	15680as	
1535	1600	Sat/Sun	Austria, Radio Austria Intl	13775ca	
1540	1600	mtwhf	UK, Bible Voice BC	13590me	
1540	1600	mtwhf	USA, WYFR/Family Radio FL	13590af	
1545	1600	m	Austria, Radio Austria Intl	13775ca	
1545	1600	twhfa	Austria, Radio Austria Intl	13775ca	
1545	1600	Sun	Germany, Pan American BC	13820me	
1545	1600	Sat	UK, Bible Voice BC	13590me	
1545	1600	Sat	USA, WYFR/Family Radio FL	13590af	
1551	1600		New Zealand, Radio NZ Intl	7145pa	
1551	1600	DRM	New Zealand, Radio NZ Intl	6095pa	

1600 UTC - 11AM EST / 10AM CST / 8AM PST

1600	1605	DRM	Canada, Radio Canada Intl	9800na	
1600	1605	Sun	Croatia, Croatian Radio	6165eu	
1600	1615	mtwhfa	Croatia, Croatian Radio	6165eu	
1600	1615		Pakistan, Radio	9365eu	9380as	11550af
			11895as	15105as	
1600	1615	twhf	UK, Bible Voice BC	13590me	
1600	1620	mtwh	Moldova, Radio DMR Pridnestrovye		5965eu
1600	1627		Czech Rep, Radio Prague	5930eu	17485af
1600	1630	vl	Eritrea, Bana Radio	5100do	
1600	1630	h	Germany, Pan American BC	13820as	
1600	1630		Guam, AWR/KSDA	11640as	11805as
1600	1630		Iran, Voice of the Islamic Rep	7370as	7330as
1600	1630		Myanmar, Radio	9730do	
1600	1630		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1600	1630	Sat/Sun	Swaziland, TWR	4760af	
1600	1630		UK, Bible Voice BC	13590me	
1600	1640	f	Moldova, Radio DMR Pridnestrovye		5965eu
1600	1645	mtwhf	USA, WYFR/Family Radio FL	13590af	
1600	1645		USA, WYFR/Family Radio FL	11830na	11865na
			17750am		
1600	1700		Anguilla, University Network	11775am	
1600	1700		Australia, CVC International	13635as	
1600	1700		Australia, Radio Australia	5995va	6080va
			9475as	9710va	11660pa
1600	1700	Sat	Canada, CBC NQ SW Service	9625na	
1600	1700		Canada, CFRX Toronto ON	6070na	
1600	1700		Canada, CFVP Calgary AB	6030na	
1600	1700		Canada, CKZN St John's NF	6160na	
1600	1700		Canada, CKZU Vancouver BC	6160na	
1600	1700		Canada, Radio Canada Intl	9515na	
1600	1700		China, China Radio Intl	6100af	9570af
			11900eu	11940eu	11965eu	13760eu
1600	1700		Costa Rica, University Network		11870va
			13750va		
1600	1700		Egypt, Radio Cairo	11740af	
1600	1700		Ethiopia, Radio	7165af	9560af
1600	1700		France, Radio France Intl	15160af	15605af
			17605af		
1600	1700		Germany, CVC Intl/Voice Africa		15715af
1600	1700		Germany, Deutsche Welle	6170as	9485as
			15640as		

1600	1700	Sun	Germany, Overcomer Ministries	17815na		
1600	1700		Germany, Universal Life	7285va		
1600	1700	fs	Italy, IRRS	7285eu		
1600	1700		Jordan, Radio	11690na		
1600	1700		Malaysia, RTM/Trax FM	7295as		
1600	1700	DRM	New Zealand, Radio NZ Intl	6095pa		
1600	1700		New Zealand, Radio NZ Intl	7145as		
1600	1700		Nigeria, Radio/Kaduna	4770do	6090al	
1600	1700		North Korea, Voice of Korea	9990va	11545va	
1600	1700	vl	Papua New Guinea, Wantok R. Light	7325va		
1600	1700		Russia, Voice of	6070as	7350as	7370eu
				9405as	9890eu	11985va	12055va
				12115va		
1600	1700	vl	Rwanda, Radio	6055do		
1600	1700		South Korea, KBS World Radio	9515eu		
1600	1700		Taiwan, Radio Taiwan Intl	11550as	15515as	
1600	1700		UK, BBC World Service	3915af	5975as	
				6190af	6195as	7320eu	9510as
				11760as	11920as	15400af	15485af
				17840af	21470af	21660af	
1600	1700	DRM	UK, BBC World Service	7465eu		
1600	1700	mtwhf	UK, BBC World Service	17830af		
1600	1700	Sat/Sun	UK, BBC World Service	9695af	11860af	
				12095af		
1600	1700	Sun	UK, Bible Voice BC	13590me		
1600	1700		USA, American Forces Radio	4319usb	5446usb	
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb	
1600	1700		USA, KAIJ Dallas TX	9480va		
1600	1700		USA, KJES Vado NM	11715na		
1600	1700		USA, KTBN Salt Lake City UT	15590na		
1600	1700		USA, KWHR Naalehu HI	9930as		
1600	1700		USA, Voice of America	4930af	6080af	
				12080va	13600va	15580af	17895va
1600	1700		USA, WBCQ Monticello ME	9330am		
1600	1700		USA, WBOH Newport NC	5920am		
1600	1700		USA, WEWN Vandiver AL	9450am		
1600	1700		USA, WHRA Greenbush ME	17640na		
1600	1700		USA, WHRI Cypress Creek SC		9840am	
				11960am	17640am	
1600	1700		USA, WINB Red Lion PA	13570am		
1600	1700	smtwhf	USA, WMLK Bethel PA	9265va	17495va	
1600	1700		USA, WRMI Miami FL	9955va		
1600	1700		USA, WTJC Newport NC	9370na		
1600	1700		USA, WWCR Nashville TN	9985na	12160na	
				13845na	15825na	
1600	1700		USA, WWRB Manchester TN	9385na		
1600	1700	Sun	USA, WYFR/Family Radio FL	13590af		
1600	1700		USA, WYFR/Family Radio FL	6085am	13630af	
				13695na	15650na	15705af	18980va
				21455va	21525af	
1600	1700		Zambia, CVC International	15715af		
1615	1630		Vatican City, Vatican Radio	4005va	7250va	
				9645va	15595va	
1615	1645	mtwhf	Swaziland, TWR	6130af		
1615	1700		UK, Bible Voice BC	13590me		
1630	1645	Sun	Germany, Pan American BC	11655as		
1630	1645		UK, Bible Voice BC	13590me		
1630	1657		Slovakia, Radio Slovakia Int	5920eu	6055eu	
1630	1700		Guam, AWR/KSDA	6155as		
1630	1700		Nigeria, Voice of/ Ext. Svc Lagos		15120af	
1630	1700	Sat/Sun	Swaziland, TWR	6130af		
1630	1700	Sun	UK, Bible Voice BC	13590me		
1640	1650	mtwhfa	Turkmenistan, Turkmen Radio	4930eu		
1645	1700	f	Sweden, IBRA Radio	9830as		
1645	1700		Tajikistan, Tajik Radio	7245as		
1645	1700	t/ vl	USA, WYFR/Family Radio FL	13590af		

1700 UTC - 12PM EST / 11AM CST / 9AM PST

1700	1704		Canada, Radio Canada Intl	9515na		
1700	1715		Swaziland, TWR	3200af		
1700	1715	vl	UK, Bible Voice BC	13590me		
1700	1715	t/ vl	USA, WYFR/Family Radio FL	13590af		
1700	1725		Vietnam, Voice of	7280va	9550va	9725eu
				11630va	13860va	
1700	1727		Czech Rep, Radio Prague	5930eu	17485af	
1700	1730		Jordan, Radio	11690na		
1700	1730	Sun	UK, Bible Voice BC	13590me		
1700	1730		UK, Bible Voice BC	13590me		
1700	1730	Sat/Sun	USA, Voice of America	4930af		
1700	1730		USA, Voice of America	6080af	15580af	
1700	1730	Sun	USA, WYFR/Family Radio FL	13590af		
1700	1745		UK, BBC World Service	9630af		
1700	1755		South Africa, Channel Africa	15235af		
1700	1756		Romania, Radio Romania Intl	9535eu	11735eu	
1700	1800		Anguilla, University Network	11775am		
1700	1800		Australia, CVC International	13635as		
1700	1800		Australia, Radio Australia	5995va	6080va	

				9475as	9580va	9710as	11880va
1700	1800	Sat	Canada, CBC NQ SW Service	9625na		
1700	1800		Canada, CFRX Toronto ON	6070na		
1700	1800		Canada, CFVP Calgary AB	6030na		
1700	1800		Canada, CKZN St John's NF	6160na		
1700	1800		Canada, CKZU Vancouver BC		6160na	
1700	1800		China, China Radio Intl	6100af	9570af	
				9695eu	11900af	11940eu	13760eu
1700	1800		Costa Rica, University Network		11870va	
				13750va		
1700	1800		Egypt, Radio Cairo	11740af		
1700	1800		Eqt. Guinea, Radio Africa	15190af		
1700	1800		Germany, CVC Intl/Voice Africa		15715af	
1700	1800		Germany, Universal Life	7285va		
1700	1800	fs	Italy, IRRS	7285eu		
1700	1800		Malaysia, RTM/Trax FM	7295as		
1700	1800		New Zealand, Radio NZ Intl	7145pa		
1700	1800	DRM	New Zealand, Radio NZ Intl	6095pa		
1700	1800		Nigeria, Radio/Kaduna	4770do	6090al	
1700	1800		Nigeria, Voice of/ Ext. Svc Lagos		15120af	
1700	1800	vl	Papua New Guinea, Wantok R. Light		7325va	
1700	1800		Poland, Radio Polonia	7140eu	7265eu	
1700	1800		Russia, Voice of	7350as	9405as	9850af
				11510af	11985af	
1700	1800	Sat/Sun	Russia, Voice of	9820eu	9890eu	
1700	1800	vl	Rwanda, Radio	6055do		
1700	1800		Taiwan, Radio Taiwan Intl	15690af		
1700	1800	mtwhf	UK, BBC World Service	17830af		
1700	1800	DRM	UK, BBC World Service	1296eu	7465eu	
1700	1800		UK, BBC World Service	3915af	5975as	
				6190af	6195eu	7320eu	7380af
				9410va	9510as	11955as	12095af
				15400af	15485af	17840af	21470af
1700	1800	Sat	UK, Bible Voice BC	9430me		
1700	1800		USA, American Forces Radio	4319usb	5446usb	
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb	
1700	1800		USA, KAIJ Dallas TX	9480va		
1700	1800		USA, KTBN Salt Lake City UT	15590na		
1700	1800		USA, KWHR Naalehu HI	9930as		
1700	1800		USA, WBCQ Monticello ME	9330am	17495am	
1700	1800		USA, WBOH Newport NC	5920am		
1700	1800		USA, WEWN Vandiver AL	9450na	15390eu	
1700	1800		USA, WHRA Greenbush ME	15705na		
1700	1800		USA, WHRI Cypress Creek SC		9840am	
				11960am	15705am	
1700	1800		USA, WINB Red Lion PA	13570am		
1700	1800	smtwhf	USA, WMLK Bethel PA	9265va	17495va	
1700	1800		USA, WRMI Miami FL	9955va		
1700	1800		USA, WTJC Newport NC	9370na		
1700	1800		USA, WWCR Nashville TN	9985na	12160na	
				13845na	15825na	
1700	1800		USA, WWRB Manchester TN	9385na	12180na	
				15250va		
1700	1800	Sat/ vl	USA, WYFR/Family Radio FL	13590af		
1700	1800		USA, WYFR/Family Radio FL	9890af	13630af	
				13690na	15650af	17795am	18980va
				21455va		
1700	1800		Zambia, CVC International	15715af		
1700	1750		North Korea, Voice of Korea	9335na	11710na	
				12014na	15245na	
1705	1800	DRM	Canada, Radio Canada Intl	9800va		
1730	1745		Israel, Kol Israel	9345va	11590va	13675eu
1730	1800		Bulgaria, Radio	5900eu	9600eu	
1730	1800		Guam, AWR/KSDA	9980me		
1730	1800	vl	Liberia, ELWA	4760do		
1730	1800		Swaziland, TWR	9500af		
1730	1800	DRM	Sweden, Radio	5955eu		
1730	1800		Sweden, Radio	6065va		
1730	1800		UK, Bible Voice BC	9430me	13590me	
1730	1800	Sat/Sun	USA, Voice of America	4930af		
1730	1800		USA, Voice of America	6080af	15410af	
				15580af		
1730	1800	mtwhf	USA, Voice of America	4930af	13755af	
				15775af		
1730	1800		Vatican City, Vatican Radio	11625af	13765af	
				15570af		
1745	1800		Bangladesh, Bangla Betar	7185as		
1745	1800		India, All India Radio	7410eu	9445af	
				9950eu	11620eu	11935af	13605af
				15075af	15155af	17670af	

1800 UTC - 1PM EST / 12PM CST / 10AM PST

1800	1815	Sat	UK, Bible Voice BC	11875as		
1800	1828		Vietnam, Voice of	5955eu	7280va	9730va
1800	1830	w	Austria, AWR Europe	15315af		
1800	1830	f	Italy, IRRS	7285eu		
1800	1830		Nigeria, Radio, Natl Svc/Abuja		7275do	
1800	1830		South Africa, AWR Africa	3215af	3345af	
				9610af		

1800	1830		UK, BBC World Service	5975as	11955as
1800	1830	Sun	UK, Bible Voice BC	6060eu	
1800	1830		UK, Bible Voice BC	13590me	
1800	1830	Sat/Sun	USA, Voice of America	4930af	
1800	1830		USA, Voice of America	6080af	15410af
			15580af	17895af	
1800	1830	Sat/ vl	USA, WYFR/Family Radio FL	13590af	
1800	1845	Sat	UK, Bible Voice BC	6060eu	
1800	1845		USA, WYFR/Family Radio FL	17535af	
1800	1850		New Zealand, Radio NZ Intl	7145pa	
1800	1850	DRM	New Zealand, Radio NZ Intl	9870pa	
1800	1900		Anguilla, University Network	11775am	
1800	1900	mtwhf	Argentina, RAE	9690eu	15345eu
1800	1900		Australia, Radio Australia	6080va	9475as
			9580va	9710va	11880va
1800	1900		Bangladesh, Bangla Betar	7185eu	
1800	1900		Canada, CFRX Toronto ON	6070na	
1800	1900		Canada, CFVP Calgary AB	6030na	
1800	1900		Canada, CKZN St John's NF	6160na	
1800	1900		Canada, CKZU Vancouver BC		6160na
1800	1900		Canada, Radio Canada Intl	9530af	11765af
			15235af	17810af	
1800	1900	DRM	Canada, Radio Canada Intl	9800na	
1800	1900		China, China Radio Intl	9600eu	11940eu
			13760eu		
1800	1900		Costa Rica, University Network		11870va
			13750va		
1800	1900		Eqt. Guinea, Radio Africa	15190af	
1800	1900		Germany, CVC Intl/Voice Africa	13820af	
1800	1900		Germany, Universal Life	7285va	
1800	1900		India, All India Radio	7410eu	9445af
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af
1800	1900	Sun	Italy, IRRS	7285eu	
1800	1900		Kuwait, Radio Kuwait	11990na	
1800	1900	vl	Liberia, ELWA	4760do	
1800	1900		Malaysia, RTM/Trax FM	7295as	
1800	1900		Netherlands, Radio	6020af	7125af
			11655af		
1800	1900		Nigeria, Radio/Kaduna	4770do	6090al
1800	1900		Nigeria, Voice of/ Ext. Svc Lagos	15120af	
1800	1900		North Korea, Voice of Korea	13760eu	15245eu
1800	1900	vl	Papua New Guinea, Wantok R. Light	7325va	
1800	1900		Russia, Voice of	7370eu	9480eu	9745af
			9580eu	9890eu	11510af
1800	1900	vl	Rwanda, Radio	6055do	
1800	1900		South Korea, KBS World Radio		7275eu
1800	1900		Swaziland, TWR	3200af	9500af
1800	1900		Taiwan, Radio Taiwan Intl	3965eu	
1800	1900	DRM	UK, BBC World Service	7420eu	
1800	1900		UK, BBC World Service	5975as	5995as
			6190af	6195eu	7380af	9410va
			12095eu	15400af	17795af	21470af
1800	1900	mtwhf	UK, BBC World Service	17830af	
1800	1900	Sat/Sun	UK, Bible Voice BC	9430me	
1800	1900		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb	
1800	1900		USA, KAIJ Dallas TX	9480va	
1800	1900		USA, KJES Vado NM	15385na	
1800	1900		USA, KTBN Salt Lake City UT	15590na	
1800	1900	smtwhf	USA, WBCQ Monticello ME	7415am	
1800	1900		USA, WBCQ Monticello ME	9330am	17495am
1800	1900		USA, WBOH Newport NC	5920am	
1800	1900		USA, WEWN Vandiver AL	9450na	15390eu
1800	1900		USA, WHRA Greenbush ME	15705na	
1800	1900		USA, WHRI Cypress Creek SC		9840am
			11960am	15705am	
1800	1900		USA, WINB Red Lion PA	13570am	
1800	1900	smtwhf	USA, WMLK Bethel PA	9265va	17495va
1800	1900		USA, WRMI Miami FL	9955va	
1800	1900		USA, WTJC Newport NC	9370na	
1800	1900		USA, WWCR Nashville TN	9975na	12160na
			13845na	15825na	
1800	1900		USA, WWRB Manchester TN	9385va	12180na
			15250va		
1800	1900		USA, WYFR/Family Radio FL	9845af	9860af
			13630af	13690af	13730af	13800na
			15650af	15750af	17795va	18980va
1800	1900		Yemen, Rep of Yemen Radio	9780me	
1800	1900		Zambia, CVC International	5940af	
1805	1810	Sat	Croatia, Croatian Radio	6165eu	
1805	1815	mtwhf	Croatia, Croatian Radio	6165eu	
1830	1857		Slovakia, Radio Slovakia Int	5920eu	6055eu
1830	1858		Serbia, International Radio Serbia	7240eu	
1830	1900		Turkey, Voice of	9785eu	
1830	1900		UK, BBC World Service	6005af	9485as
			9630af		
1830	1900	f	UK, Bible Voice BC	9430me	

1830	1900		USA, Voice of America	4930af	6080af
			15410af	15580af	17895af
1845	1900		Congo, RTV Congolaise	4765af	5985af
1845	1900	Sun	UK, Bible Voice BC	9775af	
1851	1900	DRM	New Zealand, Radio NZ Intl	9890pa	
1851	1900		New Zealand, Radio NZ Intl	9615pa	

1900 UTC - 2PM EST / 1PM CST / 11AM PST

1900	1903		Bahrain, Radio Bahrain	6010as	
1900	1905	DRM	Canada, Radio Canada Intl	9800na	
1900	1915		Congo, RTV Congolaise	4765af	5985af
1900	1928		Vietnam, Voice of	7280va	9730va
1900	1930		Germany, Deutsche Welle	9895af	11795as
			17820af		
1900	1930		Turkey, Voice of	9785eu	
1900	1930	Sat	UK, Bible Voice BC	9775af	
1900	1930		UK, Bible Voice BC	6060eu	
1900	1945		India, All India Radio	7410eu	9445af
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af
1900	1945		USA, WYFR/Family Radio FL	6085am	
1900	1957	Sat/Sun	Netherlands, Radio	15315na	17660va
			17735af		
1900	2000		Anguilla, University Network	11775am	
1900	2000		Australia, Radio Australia	6080va	9500as
			9580va	9710va	11880as
1900	2000		Canada, CFRX Toronto ON	6070na	
1900	2000		Canada, CFVP Calgary AB	6030na	
1900	2000		Canada, CKZN St John's NF	6160na	
1900	2000		Canada, CKZU Vancouver BC		6160na
1900	2000		China, China Radio Intl	7295va	9435va
			9440va	11940va	
1900	2000		Costa Rica, University Network		11870va
			13750va		
1900	2000		Egypt, Radio Cairo	15375af	
1900	2000		Eqt Guinea, Radio Africa	15190af	
1900	2000		Germany, CVC Intl/Voice Africa	13820af	
1900	2000	vl	Liberia, ELWA	4760do	
1900	2000		Malaysia, RTM/Trax FM	7295as	
1900	2000		Netherlands, Radio	5905af	7115af
			11655af	17810af	
1900	2000		New Zealand, Radio NZ Intl	9615pa	
1900	2000	DRM	New Zealand, Radio NZ Intl	9890pa	
1900	2000		Nigeria, Radio/Kaduna	4770do	6090al
1900	2000		Nigeria, Voice of/ Ext. Svc Lagos	15120af	
1900	2000		North Korea, Voice of Korea	7100af	9975va
			11535va	11910af	
1900	2000		Papua New Guinea, NBC	4890do	
1900	2000	vl	Papua New Guinea, Wantok R. Light	7325va	
1900	2000		Russia, Voice of	7195eu	7310eu	9890eu
			12070eu		
1900	2000	vl	Rwanda, Radio	6055do	
1900	2000	vl	Solomon Islands, SIBC	5020do	9545al
1900	2000		Swaziland, TWR	3200af	
1900	2000	vl	Uganda, Radio	4976do	5026do
1900	2000	DRM	UK, BBC World Service	7420eu	
1900	2000		UK, BBC World Service	5995as	6005as
			6190af	9410af	9455af	9485af
			9630as	15400af	17795as
1900	2000	mtwhf	UK, BBC World Service	17830af	
1900	2000	Sun	UK, Bible Voice BC	9775af	
1900	2000		Ukraine, Radio Ukraine Intl	5830eu	
1900	2000		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb	
1900	2000		USA, KAIJ Dallas TX	9480va	
1900	2000		USA, KJES Vado NM	15385na	
1900	2000		USA, KTBN Salt Lake City UT	15590na	
1900	2000		USA, Voice of America	4930af	4940af
			6080af	7480va	9670va	15410af
			15445af	15580af	17895af
1900	2000		USA, WBCQ Monticello ME	7415am	9330am
			17495am		
1900	2000		USA, WBOH Newport NC	5920am	
1900	2000		USA, WEWN Vandiver AL	9450na	15390eu
1900	2000		USA, WHRA Greenbush ME	13710na	
1900	2000		USA, WHRI Cypress Creek SC		9840am
			13710am	17650am	
1900	2000		USA, WINB Red Lion PA	13570am	
1900	2000	smtwhf	USA, WMLK Bethel PA	9265va	17495va
1900	2000		USA, WRMI Miami FL	9955va	
1900	2000		USA, WTJC Newport NC	9370na	
1900	2000		USA, WWCR Nashville TN	9975na	12160na
			13845na	15825na	
1900	2000		USA, WWRB Manchester TN	9385va	12180na
			15250va		
1900	2000		USA, WYFR/Family Radio FL	7240va	9520eu
			9610af	9860af	13690na	13800na
			17795am	17845af	18930eu

1900	2000		Zambia, CVC International	5940af	
1900	2000		Kuwait, Radio Kuwait	11990na	
1930	2000	Sat/Sun	Germany, Pan American BC	5850me	
1930	2000		Iran, Voice of the Islamic Rep	6205eu	6255eu
			7205af	9800af	9925af
1930	2000		Lithuania, Radio Vilnius	6255eu	
1930	2000		Sweden, Radio	6065va	
1945	2000	mtwhfa	Albania, Radio Tirana	6135eu	7465eu
1945	2000	DRM	Vatican City, Vatican Radio	9800na	
1950	2000		Vatican City, Vatican Radio	4005eu	5885eu
			9645eu		

2000 UTC - 3PM EST / 2PM CST / 12PM PST

2000	2015	Sun	Germany, Pan American BC	5850me	
2000	2020		Vatican City, Vatican Radio	4005af	5885af
			9645af		
2000	2027		Czech Rep, Radio Prague	5930eu	11600va
2000	2027		Lithuania, Radio Vilnius	6255eu	
2000	2030		Egypt, Radio Cairo	15375af	
2000	2030		Germany, AWR Europe	15235as	
2000	2030	f	Germany, Pan American BC	5850me	
2000	2030		Iran, Voice of the Islamic Rep	6205eu	6255eu
			7205af	9800af	9925af
2000	2030		Swaziland, TWR	3200af	
2000	2030		Turkey, Voice of	6195eu	
2000	2030		USA, Voice of America	4930af	4940af
			6080af	15455af	15580af
2000	2030		Vatican City, Vatican Radio	7365af	9755af
			11625af		
2000	2030	DRM	Vatican City, Vatican Radio	9800na	
2000	2045		USA, WYFR/Family Radio FL	17750va	
2000	2050		New Zealand, Radio NZ Intl	9615pa	
2000	2050	DRM	New Zealand, Radio NZ Intl	9890pa	
2000	2057		Germany, Deutsche Welle	7130af	11795af
2000	2059		Canada, Radio Canada Intl	5850af	7235eu
			15325eu		
2000	2100		Anguilla, University Network	11775am	
2000	2100		Australia, ABC NT Alice Springs		2310do
			4835do		
2000	2100		Australia, ABC NT Katherine	2485do	
2000	2100		Australia, ABC NT Tennant Creek		2325do
2000	2100		Australia, Radio Australia	9500as	11650pa
			11660pa	11880as	12080va
2000	2100	Sat/Sun	Australia, Radio Australia	6080va	
2000	2100		Canada, CFRX Toronto ON	6070na	
2000	2100		Canada, CFVP Calgary AB	6030na	
2000	2100		Canada, CKZN St John's NF	6160na	
2000	2100		Canada, CKZU Vancouver BC		6160na
2000	2100	DRM	Canada, Radio Canada Intl	9800na	
2000	2100		China, China Radio Intl	5960eu	7190eu
			7265eu	7295eu	9440eu	9600eu
			9800eu	11640af	13630af
2000	2100		Costa Rica, University Network		13750va
2000	2100		Eqt Guinea, Radio Africa	15190af	
2000	2100		Germany, CVC Intl/Voice Africa		13820af
2000	2100		Germany, Deutsche Welle	11865af	15205af
2000	2100		Indonesia, Voice of	9525eu	11785eu
			15150al		
2000	2100		Kuwait, Radio Kuwait	11990na	
2000	2100	vl	Liberia, ELWA	4760do	
2000	2100		Malaysia, RTM/Trax FM	7295as	
2000	2100		Netherlands, Radio	5905af	7115af
			17810af		
2000	2100	Sat/Sun	Netherlands, Radio	15315na	17660va
			17735na		
2000	2100		Nigeria, Radio/Kaduna	4770do	6090al
2000	2100		Nigeria, Voice of/ Ext. Svc Lagos		15120af
2000	2100		Papua New Guinea, NBC	4890do	
2000	2100	vl	Papua New Guinea, Wantok R. Light	7325va	
2000	2100		Russia, Voice of	9890eu	12070eu
2000	2100	vl	Rwanda, Radio	6055do	
2000	2100	vl	Solomon Islands, SIBC	5020do	9545al
2000	2100		South Africa, Channel Africa	3345af	
2000	2100	mtwhf	Spain, Radio Exterior Espana	9665eu	11625eu
2000	2100	vl	Uganda, Radio	4976do	5026do
2000	2100		UK, BBC World Service	6005af	6190af
			9410af	9455af	9630af	15400af
2000	2100	mtwhf	UK, BBC World Service	17830af	
2000	2100	DRM	UK, BBC World Service	5875eu	
2000	2100		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb	
2000	2100		USA, KAIJ Dallas TX	9480va	
2000	2100		USA, KJES Vado NM	15385na	
2000	2100		USA, KTBN Salt Lake City UT	15590na	
2000	2100		USA, WBCQ Monticello ME	7415am	9330am
			17495am		
2000	2100		USA, WBOH Newport NC	5920am	
2000	2100		USA, WEWN Vandiver AL	9450na	15220af

2000	2100	mtwhf	USA, WHRA Greenbush ME	7400na	
2000	2100	Sat/Sun	USA, WHRA Greenbush ME	11885na	
2000	2100		USA, WHRI Cypress Creek SC		17650am
2000	2100	Sat/Sun	USA, WHRI Cypress Creek SC	9840am	
			11885am		
2000	2100	mtwhf	USA, WHRI Cypress Creek SC	7400am	
			13670am		
2000	2100		USA, WINB Red Lion PA	13570am	
2000	2100	smtwhf	USA, WMLK Bethel PA	9265va	17495va
2000	2100		USA, WRMI Miami FL	9955va	
2000	2100		USA, WTJC Newport NC	9370va	
2000	2100		USA, WWCR Nashville TN	9975na	12160na
			13845na		
2000	2100		USA, WWRB Manchester TN	9385va	12180na
			15250va		
2000	2100		USA, WYFR/Family Radio FL	3230af	7430eu
			9520eu	17725am	17845af	18980va
2000	2100		Zambia, CVC International	5940af	
2005	2100		Syria, Radio Damascus	9330eu	12085eu
2020	2100		Belarus, Radio	7105eu	7390eu	7420eu
			7440al		
2030	2045		Thailand, Radio	9680eu	
2030	2056		Romania, Radio Romania Intl	9515va	11810va
			11940va	15465va	
2030	2058		Vietnam, Voice of	7280va	9550va	9730va
			13860va		
2030	2100		Cuba, Radio Havana	9505va	11760va
2030	2100	DRM	Netherlands, Radio	9800na	
2030	2100		Turkey, Voice of	7170va	
2030	2100		USA, Voice of America	4930af	6080af
			7555as	15445af	15580af
2030	2100	Sat/Sun	USA, Voice of America	4940af	
2045	2100		India, All India Radio	7410eu	9445eu
			9910pa	11620va	11715pa
2051	2100		New Zealand, Radio NZ Intl	15720pa	

2100 UTC - 4PM EST / 3PM CST / 1PM PST

2100	2130	twhfas	Albania, Radio Tirana	7430eu	9915na
2100	2130		Australia, ABC NT Katherine	2485do	
2100	2130		Australia, ABC NT Tennant Creek		2325do
2100	2130		Austria, AWR Europe	11955af	
2100	2130	Sat	Canada, CBC NQ SW Service	9625na	
2100	2130		China, China Radio Intl	5960eu	7190eu
			7285eu	9490eu	9600eu	11640af
			13630af		
2100	2130		Cuba, Radio Havana	9505va	11760va
2100	2130		Nigeria, Radio, Natl Svc/Abuja	7275do	
2100	2130		South Korea, KBS World Radio	3955eu	
2100	2130		Turkey, Voice of	7170va	
2100	2145		USA, WYFR/Family Radio FL	13800na	17795am
			18980va		
2100	2150	DRM	New Zealand, Radio NZ Intl	11675pa	
2100	2159	smtwhf	Germany, Overcomer Ministries	7310eu	
2100	2159	Sat/Sun	Spain, Radio Exterior Espana	9840eu	11625af
2100	2200		Anguilla, University Network	11775am	
2100	2200		Australia, ABC NT Alice Springs		2310do
			4835do		
2100	2200		Australia, Radio Australia	9500as	9660as
			11650pa	11660pa	11695as	12080as
			13630as	15515as	
2100	2200		Bulgaria, Radio	5900eu	9700eu
2100	2200		Canada, CFRX Toronto ON	6070na	
2100	2200		Canada, CFVP Calgary AB	6030na	
2100	2200		Canada, CKZN St John's NF	6160na	
2100	2200		Canada, CKZU Vancouver BC		6160na
2100	2200		Costa Rica, University Network		13750va
2100	2200		Eqt Guinea, Radio Africa	15190af	
2100	2200		Germany, Deutsche Welle	9735af	11865af
			15205af		
2100	2200		Guyana, Voice of	3291do	5950do
2100	2200		India, All India Radio	7410eu	9445eu
			9910pa	11620va	11715pa
2100	2200	vl	Liberia, ELWA	4760do	
2100	2200		Malaysia, RTM/Trax FM	7295as	
2100	2200		New Zealand, Radio NZ Intl	15720pa	
2100	2200		Nigeria, Radio/Kaduna	4770do	6090al
2100	2200		Nigeria, Voice of/ Ext. Svc Lagos		7255af
2100	2200		North Korea, Voice of Korea	13760eu	15245eu
2100	2200		Papua New Guinea, NBC	4890do	
2100	2200	vl	Papua New Guinea, Wantok R. Light	7325va	
2100	2200		South Africa, Channel Africa	3345af	
2100	2200		Syria, Radio Damascus	9330eu	12085eu
2100	2200		UK, BBC World Service	3915as	5975as
			6005af	6190af	6195af	11675am
			11945as	12095am	13640af	15400af
2100	2200	DRM	UK, BBC World Service	5875eu	
2100	2200		Ukraine, Radio Ukraine Intl	5830eu	
2100	2200		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb

			12133usb 13362usb				
2100	2200		USA, KAIJ Dallas TX	9480va			
2100	2200		USA, KTBN Salt Lake City UT	15590na			
2100	2200		USA, Voice of America	6080af	15580af		
2100	2200		USA, WBCQ Monticello ME	7415am	9330am		
			17495am				
2100	2200		USA, WBOH Newport NC	5920am			
2100	2200		USA, WEWN Vandiver AL	9450na	15220af		
2100	2200	mtwhf	USA, WHRA Greenbush ME	7400na			
2100	2200	Sat/Sun	USA, WHRA Greenbush ME	11885na			
2100	2200	mtwhf	USA, WHRI Cypress Creek SC		7400am		
			13670am				
2100	2200	Sat/Sun	USA, WHRI Cypress Creek SC		11885am		
2100	2200		USA, WINB Red Lion PA	13570am			
2100	2200	mtwhfa	USA, WRMI Miami FL	9955va			
2100	2200	Sun	USA, WRMI Miami FL	7385na			
2100	2200		USA, WTJC Newport NC	9370na			
2100	2200		USA, WWCR Nashville TN	9975na	12160na		
			13845na				
2100	2200		USA, WWRB Manchester TN	9385va	12180na		
			15250va				
2100	2200		USA, WYFR/Family Radio FL	3230af	7430eu		
			9610af 11565eu	17795am	17845af		
2115	2200		Egypt, Radio Cairo	9990eu			
2130	2157		Czech Rep, Radio Prague	9410af	11600na		
2130	2200		Australia, ABC NT Katherine	5025do			
2130	2200		Australia, ABC NT Tennant Creek		4910do		
2130	2200	mtwhfa	Canada, CBC NQ SW Service	9625na			
2130	2200		Guam, AWR/KSDA	11850as			
2130	2200		Sweden, Radio 6065va	7420va			
2151	2200	DRM	New Zealand, Radio NZ Intl	13730pa			

2200 UTC - 5PM EST / 4PM CST / 2PM PST

2200	2210		Syria, Radio Damascus	9330eu	12085eu		
2200	2220		Japan, NHK World/Radio Japan	13640pa			
2200	2230	DRM	Germany, Deutsche Welle	9800na			
2200	2230		India, All India Radio	7410eu	9445eu		
			9910pa 11620va	11715pa			
2200	2230	vl	Liberia, ELWA	4760do			
2200	2230		Papua New Guinea, NBC	4890do			
2200	2245		Egypt, Radio Cairo	9990eu			
2200	2245		USA, WYFR/Family Radio FL	15770af			
2200	2256		Romania, Radio Romania Intl	7185va	9675va		
			9790va 11940va				
2200	2300		Anguilla, University Network	6090am			
2200	2300		Australia, ABC NT Alice Springs		2310do		
			4835do				
2200	2300		Australia, ABC NT Katherine	5025do			
2200	2300		Australia, ABC NT Tennant Creek		4910do		
2200	2300		Australia, Radio Australia	11840va	13630va		
			15230va 15240pa	15515as	17785va		
2200	2300	smtwhf	Canada, CBC NQ SW Service	9625na			
2200	2300		Canada, CFRX Toronto ON	6070na			
2200	2300		Canada, CFVP Calgary AB	6030na			
2200	2300		Canada, CKZN St John's NF	6160na			
2200	2300		Canada, CKZU Vancouver BC		6160na		
2200	2300	DRM	Canada, Radio Canada Intl	9800va			
2200	2300		China, China Radio Intl	7175eu	9590as		
2200	2300		Costa Rica, University Network		13750va		
2200	2300		Eqt Guinea, Radio Africa	15190af			
2200	2300		Guyana, Voice of 3291do				
2200	2300		Malaysia, RTM/Trax FM	7295as			
2200	2300	DRM	New Zealand, Radio NZ Intl	13730pa			
2200	2300		New Zealand, Radio NZ Intl	15720pa			
2200	2300		Nigeria, Radio/Kaduna	4770do	6090al		
2200	2300		Nigeria, Voice of/ Ext. Svc Lagos		7255af		
2200	2300	vl	Papua New Guinea, Wantok R. Light	7325va			
2200	2300	vl	Solomon Islands, SIBC	5020do	9545al		
2200	2300		Taiwan, Radio Taiwan Intl	15600eu			
2200	2300		Turkey, Voice of 6195va				
2200	2300		UK, BBC World Service	5955as	5965as		
			5975am 6195as	7105as	9740as		
			12095af 13640am	15400af			
2200	2300		USA, American Forces Radio	4319usb	5446usb		
			5765usb 6350usb	7811usb	10320usb		
			12133usb 13362usb				
2200	2300		USA, KAIJ Dallas TX	9480va			
2200	2300		USA, KTBN Salt Lake City UT	15590na			
2200	2300		USA, Voice of America	7120va	9415as		
			11725va 15185va				
2200	2300	mtwhf	USA, WBCQ Monticello ME	5110am	17495am		
2200	2300		USA, WBCQ Monticello ME	7415am	9330na		
2200	2300		USA, WBOH Newport NC	5920am			
2200	2300		USA, WEWN Vandiver AL	9975na	15745eu		
2200	2300		USA, WHRA Greenbush ME	11885na			
2200	2300	mtwhfa	USA, WHRI Cypress Creek SC		9515am		
2200	2300		USA, WHRI Cypress Creek SC		11885am		
2200	2300		USA, WINB Red Lion PA	13570am			
2200	2300		USA, WRMI Miami FL	9955va			
2200	2300		USA, WTJC Newport NC	9370na			
2200	2300		USA, WWCR Nashville TN	7465na	9985na		

			12160na 13845na				
2200	2300		USA, WWRB Manchester TN	6890va	9385va		
			12180na 15250na				
2200	2300	Sat/Sun	USA, WWRB Manchester TN	3185na	15250va		
			15250va				
2200	2300		USA, WYFR/Family Radio FL	9620af	11740va		
2215	2230		Croatia, Croatian Radio	6165eu	9925eu		
2230	2257		Czech Rep, Radio Prague	7345na	9415na		
2230	2300		Guam, AWR/KSDA	15320as			
2230	2300		Papua New Guinea, NBC	9675do			
2230	2300		USA, Voice of America	9570va	11705va		
			15145va				
2245	2300		India, All India Radio	9705as	9950as		
			11620as 11645as	13605as			

2300 UTC - 6PM EST / 5PM CST / 3PM PST

2300	0000		Anguilla, University Network	6090am			
2300	0000		Australia, ABC NT Alice Springs		2310do		
			4835do				
2300	0000		Australia, ABC NT Katherine	5025do			
2300	0000		Australia, ABC NT Tennant Creek		4910do		
2300	0000	smtwhf	Canada, CBC NQ SW Service	9625na			
2300	0000		Canada, CFRX Toronto ON	6070na			
2300	0000		Canada, CFVP Calgary AB	6030na			
2300	0000		Canada, CKZN St John's NF	6160na			
2300	0000		Canada, CKZU Vancouver BC		6160na		
2300	0000		China, China Radio Intl	5915as	5990na		
			6145na 7180as	11685as	11840na		
2300	0000		Costa Rica, University Network		13750va		
2300	0000		Cuba, Radio Havana	9550va			
2300	0000		Egypt, Radio Cairo	9460na			
2300	0000		Guyana, Voice of 3291do				
2300	0000		India, All India Radio	9705as	9950as		
			11620as 11645as	13605as			
2300	0000		Malaysia, RTM/Trax FM	7295as			
2300	0000	DRM	New Zealand, Radio NZ Intl	13730pa			
2300	0000		New Zealand, Radio NZ Intl	15720pa			
2300	0000		Papua New Guinea, NBC	9675do			
2300	0000	vl	Papua New Guinea, Wantok R. Light	7325va			
2300	0000		Singapore, MediaCorp Radio	6150do			
2300	0000	vl	Solomon Islands, SIBC	5020do	9545al		
2300	0000		UK, BBC World Service	3915as	5965as		
			6195as 9740as	11945as	11955as		
			12010as				
2300	0000		USA, American Forces Radio	4319usb	5446usb		
			5765usb 6350usb	7811usb	10320usb		
			12133usb 13362usb				
2300	0000		USA, KAIJ Dallas TX	9480va			
2300	0000		USA, KTBN Salt Lake City UT	15590na			
2300	0000		USA, Voice of America	7120va	9415va		
			11725va 15185va				
2300	0000		USA, WBCQ Monticello ME	5110na	7415am		
			9330am 17495am				
2300	0000		USA, WBOH Newport NC	5920am			
2300	0000		USA, WEWN Vandiver AL	9975na	15745eu		
2300	0000		USA, WHRA Greenbush ME	7520na			
2300	0000	Sun	USA, WHRI Cypress Creek SC		7490am		
2300	0000		USA, WHRI Cypress Creek SC		7315am		
			7520am				
2300	0000	mtwhfa	USA, WHRI Cypress Creek SC		9515am		
2300	0000	Sun	USA, WHRI Cypress Creek SC		7490am		
2300	0000		USA, WINB Red Lion PA	9265am			
2300	0000		USA, WRMI Miami FL	9955va			
2300	0000		USA, WTJC Newport NC	9370na			
2300	0000		USA, WWCR Nashville TN	5070na	7465na		
			9985na 13845na				
2300	0000		USA, WWRB Manchester TN	3185na	5050na		
			6890na 15250va				
2300	0000		USA, WYFR/Family Radio FL	15255am	17750am		
2300	2300		Bulgaria, Radio 9700na	11700na			
2300	2315		Nigeria, Radio/Kaduna	4770do	6090al		
2300	2330		Australia, Radio Australia	9660as	11840va		
			13690pa 15230pa	15240pa	17785va		
			17795va				
2300	2330		USA, Voice of America	9570va	13755va		
			15145va				
2300	2345		USA, WYFR/Family Radio FL	11740na			
2300	2345	DRM	Vatican City, Vatican Radio	9755na			
2305	0000		Canada, Radio Canada Intl	6100na			
2305	0000		Greece, Voice of 7475eu	9420eu	15650eu		
2330	0000		Australia, Radio Australia	9660as	11840va		
			12080va 13690va	15230va	15415va		
			17750va 17785va	17795va			
2330	0000		Burma, Dem Voice of Burma	5955eu			
2330	0000		Lithuania, Radio Vilnius	9875va			
2330	0000		UK, BBC World Service	9580as			
2330	0000		USA, Voice of America	7350va	9570va		
			13755va 15145va				
2330	2358		Vietnam, Voice of 9840as	12020as			
2330	2359	DRM	Sweden, Radio 9800na				

Monitoring the UK Royal Air Force

In recent weeks the United Kingdom's Royal Air Force has made worldwide headlines. The Russians have been spreading their wings of late, flying their long range bombers off the coast of England. The RAF, of course, has been their constant escort when they are in the area.

So, in this issue of *MT's Milcom* column, we offer a profile of callsigns and frequencies used by the RAF. We begin with the callsign blocks that are assigned to the various UK military organizations and then dig a little deeper into the RAF.

UK CALLSIGN BLOCKS

Service - Assigned Callsign Blocks
Royal Air Force - GEA - GFZ, GHA - GHK, MEA - MEZ, MHD, MKA - MLZ, MPA - MRZ
Royal Army - MSH - MSU, MUA - MUZ
Royal Navy - GQA - GQZ, GXA - GZZ, MAA - MAZ, MFA - MFZ, MGB - MGC, MGE - MGZ, MHA - MHC, MHE - MHV, MHX, MJA - MJZ, MTA - MTZ, MXA - MXZ

RAF CALLSIGNS

(From official sources)

GEA	RAF Cosford
GEB	AIROPSCEN Cyprus
GEC	RAF Ascension
GED	SNCC Rudloe Manor
GEE	Skynet Ayios Nikolaos
GEF	Skynet Defford
GEH	RAF Odiham
GEM	Headquarters DCSA
GEP	TCOMMWG Brize Norton
GEP1	TCOMMWG Brize Norton
GEP2	TCOMMWG Brize Norton
GEP3	TCOMMWG Brize Norton
GEP4	TCOMMWG Brize Norton
GFA	Bracknell Met Office
GFF	ARCC Kinloss
GFG	Gilbraltar ATCC
GFJ	RAF Bentley Priory
GFK	SNCC Oakhanger
GFU	UKZE
GFW	Nicosia ATCC
GHD	Cyprus RCC
GHJ	Gilbraltar MHQ
MEG	Headquarters 2 Group Rheindahlen
MEH	GCHQ Cheltenham

RAF Sentry 1b refueling

MEJ	Oakhanger (NATO SGT)
MEL	DSTL Boscombe Down
MKD	COMMCEN Cyprus
MKE	COMMCEN Episkopi
MKJ	Skynet Episkopi
MKK	SCP Bampton Castle
MKL	Matelo MCC Bampton Castle
MKN	DSTL Aberporth
MKP	DSTL Larkhill
MKQ	Rudloe Manor
MKR	Combined Operations
MKS	Met Office Cyprus
MKT	DCIS (RAF)
MKV	DSTL Belfast
MKW	Combined Operations
MLD	81 SU Det Kinloss
MLP	81 SU Brampton Castle
MLQ	USAF Stations in UK
MLZ	Any RAF Aircraft
MPC	DSTL Brough
MPD	DSTL Farnborough
MPG	DSTL Malvern
MPV	DSTL Llanbedr
MPW	DSTL Warton
MPX	DSTL Woodford
MQD	MHQ Plymouth
MQK	Any RAF Rescue Team
MQP	Headquarters 1 Group High Wycombe
MQP1	Headquarters 1 Group High Wycombe
MQP2	Headquarters 1 Group High Wycombe
MQP3	Headquarters 1 Group High Wycombe
MQP4	Headquarters 1 Group High Wycombe
MQS	MATELO ACC Kinloss
MQT	Headquarters 3 Maritime Group Northwood
MRA	Headquarters Air Cadets
MRB	Headquarters Air Cadets
MRC	Headquarters Air Cadets
MRD	Headquarters Air Cadets
MRE	Headquarters Air Cadets
MRF	Headquarters Air Cadets
MRG	Headquarters Air Cadets
MRH	Headquarters Air Cadets
MRI	Headquarters Air Cadets
MRJ	DSTL West Freugh
MRK	Headquarters Air Cadets
MRL	Headquarters Air Cadets
MRM	Headquarters Air Cadets
MRN	Headquarters Air Cadets
MRO	Headquarters Air Cadets
MRP	HQSTC High Wycombe
MRQ	Headquarters Air Cadets
MRR	Headquarters Air Cadets
MRS	Headquarters Air Cadets
MRT	Headquarters Air Cadets
MRU	Headquarters Air Cadets
MRV	Headquarters Air Cadets

RAF FREQUENCIES

From my personal database. Frequency is in kHz, mode is usually USB, but you will run into voice encryption and some data signals.

2031.0 2250.5 2261.0 2266.0 2274.0 2350.0
2396.0 2404.0 2577.0 2591.0 2641.0 2712.0
2762.0 3026.0 3036.0 3038.0 3083.0 3092.0
3095.0 3101.0 3110.0 3119.0 3125.0 3131.0
3149.0 3218.0 3224.0 3302.0 3304.5 3307.0
3334.5 3336.5 3343.0 3345.0 3357.0 3380.0
3391.0 3404.0 3512.0 3763.0 3805.0 3864.0
3867.0 3885.0 3915.0 3924.0 3930.0 3936.0
3939.0 3942.0 3943.0 3945.0 4012.0 4020.0
4042.0 4329.5 4429.0 4448.5 4450.0 4477.0
4478.5 4484.0 4491.5 4502.0 4520.0 4540.0
4616.0 4631.0 4660.0 4706.0 4709.0 4718.0
4718.0 4724.0 4730.0 4731.0 4739.0 4742.0
4745.0 4763.0 4777.5 4778.5 4779.0 4785.0
4807.0 4841.5 4860.5 4920.0 5045.0 5063.5
5086.0 5087.5 5091.5 5095.0 5173.0 5178.0
5184.0 5206.0 5267.0 5270.0 5276.5 5277.5
5280.0 5290.0 5293.5 5310.0 5385.0 5392.0
5395.0 5403.0 5406.5 5411.5 5420.0 5436.0
5445.0 5447.0 5450.0 5460.0 5463.5 5475.0
5680.0 5684.0 5693.0 5699.0 5702.0 5705.0
5714.0 5720.0 5733.0 5747.0 5910.0 6224.0
6237.0 6262.0 6673.5 6691.0 6694.0 6697.0
6701.0 6715.0 6724.0 6736.0 6739.0 6742.0
6748.0 6754.0 6757.0 6760.0 6766.0 6779.0
6870.0 6882.0 6940.0 6997.0 7415.0 7795.0
7860.5 7919.0 7934.0 7937.0 8005.0 8115.5
8156.0 8188.0 8190.0 8500.5 8971.0 8972.0
8980.0 8983.0 8989.0 8998.0 9001.0 9010.0
9022.0 9031.0 9034.0 9037.0 9394.0 9459.0
10325.0 10375.0 10512.0 10585.0 10634.0
10830.0 10919.0 11149.0 11175.0 11181.0
11192.0 11205.0 11208.0 11217.0 11235.0
11241.0 11247.0 11253.0 11259.0 11268.0
12057.0 12198.0 13206.0 13211.0 13218.0
13236.0 13248.0 13257.0 14413.0 14460.0
14568.0 14724.0 14812.0 15013.0 15025.0
15031.0 15040.0 15046.0 15061.0 15064.0
15072.0 15076.0 15091.0 15621.0 16344.0
17970.0 17979.0 17982.0 17988.0 17995.0
18000.0 18009.0 18018.0 18024.0 18850.0
20030.0 23245.0 23250.0 23257.0 23270.0
23281.0 26385.0 27000.0 29800.0

❖ Russian Long Range Air Force

Speaking of the Russian Long Range Air Force, here are some frequencies you can monitor on HF that this military organization uses. The main station for this military service is REA4, the LRAF headquarters in Moscow. The primary mode used by REA4 is CW, but 1000/50 RTTY has also been reported.

Recently reported frequencies include:
RTTY 1000/50
    5157.0 7018.0 9193.0 kHz
CW Hourly broadcast
    4706.0 7044.0 11408.0 23961.0 kHz
CW Traffic
    2721.0 2737.0 3476.0 3531.0 4179.0 4379.0
    7018.0 7515.5 7785.5 7959.0 kHz

❖ USAF Trunk Systems, Part Deux

In last month's *Milcom* column, I covered the latest frequencies for US Air Force trunk radio systems (Andrews AFB to McGuire AFB). This month I will conclude this list of trunk radio

system starting with the home of Red Flag and the USAF Thunderbirds Flight Demonstration Team – Nellis AFB.

Nellis AFB, Nevada
408.3625 (LCN1) 407.3625 (LCN2) 409.3625 (LCN3) 407.5000 (LCN4)
Note: Nellis Air Force Base reported to be using the National Nuclear Security Administration trunk radio system. Status of this EDACS trunk system is currently unknown. Here is the latest information available on that trunk radio system.
Site 1   406.1125c   406.9750   407.3500   407.6375   408.1875   408.5875   409.3250 [Mercury]
Site 2   406.1875c   406.7875   406.9875   407.1875   407.3875   408.3875   409.6000 [Frenchmans Flat]
Site 3   406.9250c   407.5875   407.8125   408.0875   409.1250   409.5875 [Yucca Flats]
Site 4   406.1125c   406.4000c   406.9750c   407.3500c   408.1875   409.1250   409.7750 [Las Vegas NNSA]
Site 5   406.6250c   407.8875c   408.1000   408.7500   410.1750 [Skull Mountain]
Site 6   407.5625   407.9500c   408.1750c   410.1250   410.5500   410.6000 {Angels Peak}
Site 7   406.1500c [Rainier Mesa]
Site 8   406.1375c   406.4000   408.7000   409.7750   410.6500 [Shoshone Peak]
Site 9   409.6875c [Unknown location]
Site 10   406.1625   406.7625   407.1625   407.2500c   407.5625   407.9875c   408.5625   408.9625   409.1625   409.6375   409.7625   409.9625   410.1625 [Nellis AFB]
Site 11   407.0750c   408.1250   409.5250 [Creech AFB at Indian Springs]

Offutt AFB, Nebraska
406.3500c   406.7500   407.1500   407.5500c   407.9500   408.3500   408.7500   409.1500   409.5500   409.9500

Patrick AFB, Florida
Site 4 in the Kennedy Space Center Integrated Communications System (KICS) is located at Patrick.
407.9625c   408.3625c   408.7625c   409.1625c   409.5625   409.9625   410.3625   410.7625

Peterson AFB, Colorado
The frequencies are used by the base's older wideband trunk radio system. Current status is unknown now that a newer narrowband system is in operation.
406.3500   406.5500   407.1500   407.3500   407.9500   408.7500   408.9500   409.5500   409.7500   409.9500
New narrowband trunk radio system. The system is in daily use by the 302nd Airlift Wing. However, it is still in a testing phase for the rest of the base.
Site 1   406.1500   407.5625   408.0875   408.1625   408.5625   409.3125c   409.3500   409.5125c
Site 5   386.2750/396.2750c   387.4750/397.4750   387.5750/397.5750   387.7000/397.7000

Pope AFB/Fort Bragg, North Carolina
Site 1   407.0750   407.4750   407.5500   407.5625   407.8625   407.8875   408.0875   408.1250   408.5750   409.0250   409.1250   409.5625   410.1500   410.5500   410.7000   410.9000 [Honeycutt]
Site 2   407.2500   408.0500   408.4250   408.6250   409.5125   409.7000   410.3625 [Sandstone]

Robins AFB, Georgia
406.3625c   406.7625c   407.1625c   407.3625   407.9625   408.1625   408.7625   409.1625   409.5625

San Antonio, Texas – Military SmartZone

Narrowband TRS
Site 1   406.3625c   406.5000c   407.1625c   407.3625c   407.7625   407.9625   408.0875   408.1500   408.5625   408.7625   408.9625   410.3625   410.8875 [Lackland AFB/Kelly Field Annex]
Site 2   406.1500c   407.8875c   409.1625   409.3625   409.9625 [Medina Annex]
Site 3   407.8125c   409.0250c   409.3125c   410.5625c   410.7625 [Randolph AFB]
Site 4   406.5625c   406.9625c   407.2500c   407.8625   408.1000 [Fort Sam Houston]
Site 5   408.0375c   408.3625c   409.5625   410.1625 [Camp Bullis]

Sheppard AFB, Texas
406.3625c   407.7625c   408.1625c   408.9625c   409.5625   410.2375   410.6375

Travis AFB, California
406.5750c   407.1750c   407.3250   408.0000   408.1750   408.2500   409.2250   409.6500c   409.9250   410.0000c   410.2250   410.3000

Tyndall AFB, Florida
406.1625/415.1625   406.3625/415.3625c
406.5625/415.5625c   406.9625/415.9625c
407.3625/416.3625   407.7625/416.7625
408.1625/417.1625   408.5625/417.5625
408.7625/417.7625   408.9625/417.9625
409.3625/418.3625   409.7625/418.7625
410.1625/419.1625   410.5625/419.5625
410.7625/419.7625
Possible other frequencies reported recently:
406.7625/415.7625   407.1625/416.7625
407.5625/416.5625   407.9625/416.9625
408.3625/417.3625   409.5625/418.5625
409.9625/418.9625   410.3625/419.3625
410.9625/419.9625

U.S. Air Force Academy, Colorado
406.3625   406.5500   406.9625   407.3250   407.3625   407.5500   407.7625   407.9625   408.0000   408.3625c   408.7625c   409.1625c   409.5625c   409.7125   409.9625

Vandenberg AFB/Lompoc Federal Prison, California
406.3500   406.5500   406.7500   406.9500   407.1500   407.3000   407.3500   407.5500   407.7500   407.9500   408.1500   408.3000   408.5500   408.7500   408.9500   409.1500   409.3500   409.5500   409.7500   409.9500   410.1500
The system above might have been replaced by a new 380-400 MHz LMR trunk system below.
385.2125/395.2124c   386.0125/396.0125
386.1250/396.1250   386.2250/396.2250
386.3750/396.3750   386.4500/396.4500
386.4875/396.4875   386.5875/396.5875
386.6500/396.6500   386.7000/396.7000
386.8500/396.8500 [Air Terminal]
386.0375/396.0375* [Unknown]

Whiteman AFB, Missouri
406.1125c   406.1500c   406.5000   407.5500   407.8875   407.9500   408.1500   408.7625   410.7000

Wright-Patterson AFB, Ohio
408.7625   408.9625   409.1625c   409.3625   409.5625   409.9625   410.1625   410.3625   410.5625   410.7625

Since these trunk radio systems have come online, many of the older conventional radio frequencies used by the military in the VHF and UHF federal bands have been abandoned. Any additions and corrections to our list can be sent to the email address in the masthead. Next month we will start our review of US Army trunk radio systems.

❖ Monitoring Military HF
And now for a few more military HF frequen-

Russian TU-95 Bear intercepted by RAF Typhoon

cies (kHz) from the *Milcom Monitoring Post*.

18.100	Russian Navy – Russian High Command Naval Radio RDL-Moscow Headquarters (many remote sites) 36/50 Bd encrypted traffic T-600
82.800	UK RAF MKL-Northwood/Crimond (Xmitter) AMCC Secure broadcast - NATO-75
1743.0	UK Coast Guard Stornoway USB
2068.0	NATO/DoD Link 11 data transmission
2105.5	Russian Military 230/81 81-81
2232.0	NATO Naval discrete USB
2243.2	Italian Navy Voice Coordination Net [IDR401] STANAG 4285/USB
2309.2	Italian Navy Voice Coordination Net USB
2463.0	Italian Navy IDR8-Rome, Italy 850/75 RTTY
2502.5	Russian Military 220/81 81-81
2597.5	Polish Military ALE/USB
2608.4	French Navy FUO-Toulon, France 850/150 RTTY
2680.0	Israeli Navy 4XZ-Haifa CW
2730.0	Russian Military CW
2749.0	Canadian Coast Guard weather broadcast USB
2789.0	French Navy FUE-Brest 850/75 RTTY
2804.0	Russian Military MS-5/4800
2804.2	Italian Navy IGJ41-Augusta, Italy 600L 5N1 STANAG 4285
2813.9	UK Royal Navy MTI-Plymouth 150/75 CARB RTTY
2815.0	NATO/US DoD 850/75 KG-84 Cipher Stream NATO-75
2839.6	Italian Navy Voice Coordination Net STANAG 4285/USB

That does it for this issue of *MT's Milcom* column. Until next time, 73 and good hunting.

FED FILES
GOVERNMENT COMMUNICATIONS

Chris Parris
chrisparris@monitoringtimes.com
www.mt-fedfiles.blogspot.com

FED FILES FAQs

During the last few years of being at the *Fed Files* helm, I have received quite a few emails from readers asking questions about federal monitoring. I thought I would share some of these FAQs (Frequently Asked Questions) with the rest of our readers.

"I'm hearing something on xxx.xxxx (insert federal frequency here) MHz. Who is it?"

I get this one a lot from folks who may stumble upon an active frequency and have no idea who it might be. Sometimes the frequency in question is an easy one to identify, as some federal agencies have nationwide assignments. Sometimes specific frequencies are assigned to specific agencies for their use anywhere in the United States. Agencies such as the BATFE, Customs, DEA, FBI, Postal Inspectors and Secret Service all have frequencies that are dedicated exclusively for their use. Some of these frequencies I have listed on the Fed Files blog page, http://mt-fedfiles.blogspot.com.

Some frequencies are more difficult to identify, because the frequency may be assigned to more than one agency. Some frequencies may be assigned to several different agencies in different areas of the country.

One of the keys to help identify these frequencies is some additional background information on what exactly you heard. Did you hear anyone say anything? Was there a call sign, call letters, unit numbers or names mentioned? What mode (analog, analog with encryption, digital) was used? Were there any CTCSS or DCS tones monitored?

Every little bit of additional information can help identify federal radio transmissions. Just the frequency alone is often not enough information to go by, so keep listening and gather as much background intelligence as possible. Keep listening to your mystery frequency for a while and take notes of what you hear.

"What type of scanner do I need to listen to federal communications?"

If this question were asked 10 years ago, I would have said that any VHF / UHF scanner radio would work fine for federal monitoring. Nowadays, there are some special requirements that mean you do need to seek out specific features and scanner models to get the most out of your monitoring.

One of the main requirements for federal scanning has become the APCO-25 digital mode, now the mode of choice for most federal operations. Radio Shack, Uniden, and now GRE offer scanners that will receive the P-25 digital signal. There are some options from AOR that allow an external converter to be attached to a scanning receiver, though most scanners have many additional features that the federal monitor can use.

For instance, the Uniden 996 scanner allows you to define a frequency as analog or digital only. That means if you know a particular frequency in your area is used only in the P-25 digital mode, you can program it as a digital channel and avoid hearing interference from analog transmissions that might not be wanted.

"Where can I get a list of federal frequencies for my area?"

Unfortunately, there are no official sources for federal frequencies, as they are considered "For Official Use Only" and are not available outside of the federal government users.

With the growth of the Internet, however, there are many more resources for federal frequency information on line than in past years. Many personal web sites feature federal frequency information, but be careful – sometimes it's not always the most up-to-date or accurate. Many web pages have not been updated in years, and with the many changes in federal agencies and radio systems lately, these pages may not offer the best value in information.

A good site to start with is www.radioreference.com, as they do try and keep things updated. However, don't assume that the information there is 100% complete, because there are always new frequencies to be found.

There are some books and CD-ROMs available for purchase that have listings for federal frequencies. Grove Enterprises offers several CD-ROMs with federal HF and VHF/UHF frequency listings that are updated every few years. For more information visit www.grove-ent.com.

"I'm hearing strange buzzing and static sounds while listening to federal frequencies. What causes that?"

Several things could cause that. You might be trying to listen to an agency on an analog scanner that is using digital radios. That can sound like buzzing static. It could also be some interference from something in or near your listening location. Some model scanners seem to suffer from interference from pager transmitters through the federal VHF bands.

"Where can I find scanner mods or software to listen to encrypted federal agencies?"

There are no scanner modifications, software, or anything else available to the listening public that will allow you to listen to encrypted communications. Federal users are supplied with very sophisticated, secure encryption equipment to prevent not just the casual listener from hearing what they are talking about, but also criminals, terrorists and foreign governments from listening in. And besides, it is against federal law to monitor encrypted transmissions.

"I never hear any federal frequencies active in my area. Have they all gone to Nextel?"

Although it may seem in some areas that federal agencies have all packed up their radios and left, they are still out there. No federal agency has officially "gone to Nextel," referring to the Sprint mobile phone / walkie-talkie combination service. However, many federal agencies are using mobile phones, pagers and PDAs for a lot of their routine communications. This technology has slowly begun to cut back on the normal use of the land-mobile radio networks, so it may seem if they only use the cell phone for communications.

Even with federal VHF and UHF land-mobile radio systems that are still in place and being updated, sometimes radio traffic can be sparse. Federal communications are not like your local police or fire radio traffic…be patient!

"How can I pick up the bugs or wireless microphones that federal undercover agents sometimes use?"

That's an interesting subject that I have not really covered much in the *Fed Files* column ... mainly because I feel that passing out information on these systems can be too hazardous to the users. If too many people know where to tune in, pretty soon someone is going to get burned in an undercover operation.

And, for what it's worth, I have monitored some undercover body mics and wires over the years, but I've never seen the frequencies that I have confirmed to be used ever posted – anywhere.

"I'm hearing some federal agents on a stake-out near my house. Should I post what I am hearing on line?"

Short answer: No. As in the example above, all of us who have monitored public safety and federal communications have at one time or an-

other heard something that was really not meant for public knowledge. A stakeout, undercover operations, someone's name or address, and other personal information passed between units are all examples of things you might hear but should keep to yourself. Posting or emailing information like this can put people's lives in danger if someone involved in the activities being investigated was tipped off. You have little to gain by posting it compared to how much someone else has to lose. And there have been people who have tried to interfere with stakeouts and found themselves charged with a crime.

❖ Arizona Border Scanning

Since I have family in Arizona, I often get a chance to spend some time in the southern part of the state during vacations and holiday visits. Because Arizona has a long border with Mexico, there is a lot of federal radio action that can be monitored in the state. Most of the activity involves Border Patrol and Customs border interdiction operations. Other federal agencies have operations in Arizona as well, with many national parks and forests in the state.

One of the hazards of logging communications along the border is picking up stations from Mexico. They operate on a different band-plan than we do here in the US, so you may hear all types of business and personal communications coming across the border.

For years almost all the Border Patrol activity along the southern California border was encrypted P-25 digital, but most of the activity in Arizona, New Mexico, and Texas was not. The Border Patrol was just starting to utilize P-25 digital radios along the Arizona border when I was there in July and logged some of these frequencies. Reports are that more and more of the Border Patrol frequencies are now being used with P-25 digital mode as time goes on. Note that the frequencies are not changing, but the radio equipment in the field apparently has.

Here is a listing of what I picked up in Phoenix and Tucson during the last few visits there. My logs cover many visits over the last few years, but there are still a few users I am trying to positively identify. So if any Arizona readers care to help, please let me know at the *Fed Files* email address.

ARIZONA LOGGINGS

Frequency	Tone	User
162.1000		Unknown agency, transmitter on Radio Ridge, Mt. Lemmon
162.1625	167.9	Bureau of Land Management Tucson repeater, input = 163.3375
162.2125		Unknown agency
162.2250	67.0	Unknown agency, maintenance "5H calling 121C"
162.3125	88.5	DHS CBP or ICE
162.8250		Border Patrol
162.9000	100.0	Immigrations and Customs Enforcement (ICE)
162.9500	100.0	DHS ICE Eloy SPC repeater, input = 164.0500, 100.0 pl
163.3375	127.3	Unknown agency, law enforcement
163.5375	67.0	Unknown agency, maintenance, input = 173.5625
163.6250	131.8	Border Patrol, Yuma repeater
163.6500	123.0	Border Patrol, Ajo Mountain repeater, input = 162.8500, 123.0 pl
163.6500	100.0	Border Patrol, Mule Mountain repeater input = 162.8500, 100.0 pl

Frequency	Tone	User
163.6500	100.0	Border Patrol, South Mountain repeater, input = 162.8500, 100.0 pl
163.6750	123.0	Border Patrol, LDS repeater, input = 162.9250, 123.0 pl
163.6750	151.4	Border Patrol, Sasabe repeater, input = 162.8750, 151.4 pl
163.6750	123.0	Border Patrol, Lookout Mountain repeater, input = 162.8750, 123.0 pl
163.7000	123.0	Border Patrol, White Tanks Mountain repeater, input = 162.9000, 123.0 pl
163.7000	151.4	Border Patrol, Monument Peak repeater, input = 162.9000 ,151.4 pl
163.7250	P-25	Border Patrol P-25 digital
163.7250	100.0	Border Patrol, Mt. Lemmon 1 repeater, input = 162.9250, 100.0 pl
163.7500	123.0	Border Patrol, Bernadino 1 repeater, input = 162.9500, 123.0 pl
163.7500	123.0	Border Patrol, Bernadino 1 simplex
163.7750	123.0	Border Patrol, Florence repeater, input = 162.9750, 123.0 pl
163.7750	151.4	Border Patrol, Dragoon repeater, input = 162.9750, 151.4 pl
163.7750	123.0	Border Patrol, Florence repeater, input = 162.9750, 123.0 pl
163.7750	P-25	Border Patrol P-25 digital
163.7750	151.4	Border Patrol, Oatman Mountain repeater
164.0500	100.0	Border Patrol, Childs Peak repeater, input = 162.9500, 100.0 pl
164.4250	CSQ	Organ Pipe Cactus Nat'l Monument repeater, input = 163.1250, 127.3
164.2750	P-25	US Marshals, Federal Courthouse, Tucson
164.3500		Unknown agency
164.5500	CSQ	OCDETF, Black Mountain repeater, input = 168.8625, 167.9 pl
164.6000	100.0	CBP Customs NET 4 or 5
164.9000	110.9	Voice inversion scrambling, probably from Mexico
165.2375	100.0	CBP Customs NET 1 repeater, input = 166.4375, 100.0 pl
165.2375	100.0	CBP Customs NET 3 repeater, input = 166.5875, 100.0 pl
165.6375	P-25	Phoenix P-25 trunked system 534, VHF Site 107
165.7375	100.0	CBP Customs TAC 26
165.9000	100.0	Border Patrol, Benson 1 repeater, input = 162.9750, 100.0 pl
165.9500	77.0	Nogales Task Force repeater, input = 167.0000, 167.9 pl
165.9750	100.0	Border Patrol, Red Mountain repeater, input = 168.8000, 100.0 pl
166.3250		Unknown agency
166.3500	P-25	Saguaro National Monument
166.4625	CSQ	DHS Common
166.5625		Unknown agency, frequency used by CBP Customs
166.7000	P-25	Phoenix P-25 trunked system 534, VHF Site 107
166.8500	103.5	Border Patrol, Heliograph Peak repeater, input = 170.3500, 103.5 pl
166.8500	151.4	Border Patrol, Mt. Graham repeater, input = 170.3500, 151.4 pl
168.9000	100.0	Border Patrol, Mule Mountain repeater, input = 165.8500, 100.0 pl
167.2875	167.9	FBI repeater, Tucson
167.4125	167.9	FBI repeater, unknown location, input = 163.8375, 167.9 pl
167.4875	167.9	FBI simplex
167.6250	127.3	Tonto National Forest
167.7375	167.9	FBI using DES encryption
167.8250	P-25	Unknown agency, P-25 digital
167.8625		VA Medical Center, Tucson - paging
167.9750	P-25	Unknown agency
168.1500	118.8	US Forest Service repeater
168.5250		Unknown agency
168.7750	100.0	Unknown agency - repeater
168.8000	100.0	Unknown agency - repeater
168.8625		Border Patrol, Black Mountain repeater
168.9250	CSQ	Border Patrol seismic sensors
168.9000	100.0	Border Patrol, Mule Mountain 2 repeater, input = 165.8750, 100.0 pl
168.9250		Border Patrol, Telegraph Pass 1 repeater
168.9500		Border Patrol AO (Air Operations?) repeater
168.9750	100.0	Border Patrol, Mt. Lemmon 2 repeater, input = 165.8500, 100.0 pl

Frequency	Tone	User
165.9750	100.0	Border Patrol, Red Mountain repeater, input = 168.8000, 100.0 pl
168.9750	P-25	Border Patrol, Mt. Lemmon 2 P-25 digital
169.0000		Border Patrol, Telegraph Pass 2 repeater
169.0000	156.7	VA Medical Center, Tucson - Maintenance
169.0500	P-25	Unknown agency, P-25 digital
169.4000	CSQ	US Forest Service repeater
169.4500	100.0	CBP Customs NET 2 repeater, input =171.0750, 100.0 pl
169.6000	110.9	US Forest Service, Coronado NF
169.6000	114.8	US Forest Service, Coronado NF
169.9250		Unknown agency, repeater
170.1250	100.0	Tohono O' Odham Indian Fire Department
170.4875		Unknown agency
170.5250	CSQ	US Forest Service, Coronado NF
170.7000	100.0	Border Patrol, Benson 2 repeater, input = 168.8250, 100.0 pl
170.7250	123.0	Border Patrol, Bernadino 2 repeater, input = 168.8250, 123.0 pl
170.7750	CSQ	Border Patrol, seismic sensors
171.2625	P-25	VA Medical Center, Tucson
171.3875	141.3	Ft.Huachuca - Base Security
171.4125	141.3	Ft.Huachuca - Base Security
171.7250	CSQ	Chiricacha National Monument repeater, input = 172.5250
171.7500	123.0	Unknown agency, repeater
172.2750	CSQ	Coronado NF
172.4750	P-25	Unknown agency, P-25 digital
172.8250	P-25	FAA repeater, Phoenix
172.8250	P-25	FAA repeater, Mt. Lemmon
172.9000	P-25	DHS TSA @ TUS
173.1000	123.0	Tohono O' Odham Indian Fire Department
173.5625	CSQ	Unknown agency - input to 163.5375 repeater
173.6875	123.0	Border Patrol, Quijota Peak repeater, input = 171.3125, 123.0 pl
173.7125	P-25	Unknown agency, P-25 digital
173.7625	100.0	Unknown agency
173.8375	P-25	Unknown agency, P-25 digital
406.8125	P-25	Federal Correctional Institution, Tucson trunked system
407.4000	P-25	Federal Correctional Institution, Tucson trunked system
409.0125	P-25	Federal Correctional Institution, Tucson trunked system
409.4125	P-25	Federal Correctional Institution, Tucson trunked system
409.9625	P-25	Unknown agency, P-25 digital
410.0000	P-25	Federal Correctional Institution, Tucson trunked system
411.6750		Unknown agency
413.3500		Unknown agency
413.7000		Unknown agency, possibly Ft. Huachuca
415.1500	P-25	Unknown agency, P-25 digital
415.8500	CSQ	NOAA Weather Link, Mt. Lemmon
416.3625	P-25	Unknown agency (input to 407.3625)
418.9000	156.7	DEA F2, Tucson - DES encryption
418.9500	156.7	DEA F6, Phoenix
418.9750	156.7	DEA F7, Tucson
419.5625	P-25	Unknown agency (input to 410.5625)
419.8125	D031	Unknown agency, possibly Davis-Monthan AFB

Much of the DHS Border Patrol activity is scheduled to change sometime in the near future. The Justice Department's Integrated Wireless Network trunking system is planned for installation in the Arizona, New Mexico, and Texas border areas soon. What this will mean for federal scanning in the area is unknown at this time.

Up in the Pacific Northwest, where the JIWN system was first put on-line, almost all of the agencies using the trunked system have kept their radios in the "secure" or encrypted mode. However, even with the JIWN available for their use, the Border Patrol, Customs and others continue to utilize their normal, nationwide, conventional frequencies for their operations.

That's all for *Fed Files* in 2007. We'll be back in January and ring in the New Year with more federal communications!

Listening to Small Airports

In the United States, there are about 5,300 public-use airports, but you might be surprised to learn that only slightly more than 500 of them have Control Towers.

That also means that not all listeners to civilian aircraft communications will live within reception range of airports with Control Towers and an array of airliner, business jet, and cargo plane activity. If this is the case for you, the following may assist you in learning about communications at small, nontowered airports and in understanding the transmissions that you hear.

Even if you do live near a large international airport with a Control Tower and lots of air traffic, there most likely will be small airports that you can monitor for a change of pace.

Do not overlook the fact that small airports can be the homes to some interesting and varied aircraft and activities. Included can be air ambulance / medevac services, gliders and glider towing, commercial charter and air taxi services, flight instruction, parachute jump aircraft, experimental aircraft, banner towing planes, law enforcement helicopters and fixed-wing aircraft, search and rescue, Civil Air Patrol, forestry air tanker and air attack planes, and more. Some nontowered airports even have scheduled, but limited, airline service!

Hearing the departure of emergency services aircraft can be a tip-off to an event that you may wish to monitor in the public service bands as well. Let's take a look!

❖ UNICOM Communications

How do planes safely depart from and arrive at small, nontowered airports (sometimes called "uncontrolled" airports) without risking collisions in the airport area? Unlike airports with Control Towers and Air Traffic Controllers, the pilots themselves take the responsibility. They announce their intentions on an assigned UNICOM frequency for the specific airport. The frequencies

This is a standard traffic pattern at nontowered airports. It shows the various "legs" that you will hear called out on the radio. Image courtesy FAA.

An old aircraft transceiver fitted nicely into a hand-crafted cabinet serves well as the Auburn Municipal Airport (AUN) UNICOM radio on 122.7 MHz.

for each airport may be found here: **www.airnav.com/airports/**

The VHF aeronautical band is no exception when it comes to the Federal Communications Commission (FCC) designating the specific usage for each frequency. The UNICOM frequency allocations for public-use airports are (MHz):
122.7, 122.725, 122.8, 122.975, 123.0, 123.05, 123.075

A good intro to UNICOM is to listen to these frequencies on a clear weekend day – even better, a clear weekend day after a number of days of bad weather. Sometimes, depending on the listening location, there is so much activity that it is best to limit listening to just one frequency at a time.

Is there a ground side to UNICOM communications? There may not always be an airport Fixed Base Operations (FBO) employee at the radio to respond, quite unlike an airport with an operating Control Tower, but yes, there can be two-way communications. The UNICOM operator is not a Controller and can only offer advisory information, not instructions. Pilots may request weather information, wind direction, an "altimeter setting" (the current barometric pressure reading to calibrate the cockpit altimeter) and "runway in use" (meaning the current direction of use on a single landing strip), and other things like availability of gas, rental cars, and so forth.

Depending on your antenna and your distance from an airport, you may or may not hear the ground side on the occasions when they transmit and the same for aircraft on the ground.

When small public-use airports have neither a radio, an assigned UNICOM frequency, nor a nearby Flight Service Station (FSS), 122.9 is used for pilot self-announced intentions. This one should be included in your scanner as well, and it is called "MULTICOM."

When not in his office, Jim at AUN carries a handheld Icom transceiver set on the UNICOM frequency and can respond to aircraft in the air or on the ground.

Note that airports with an operating Control Tower also have a UNICOM frequency, 122.95. They use it for exchanging information and for inquiring about or arranging for services that do not relate to piloting the aircraft.

❖ Arrival Announcements

When properly executed, the pilot will say the airport name at the beginning and at the end of each UNICOM announcement. This is to avoid any confusion as to which airport a pilot is referring to as he broadcasts his intention, since there can be more than one airport on a given frequency within communications range. At the beginning of each transmission, the airport name is followed by "Traffic."

"Willows Traffic, CESSNA FIVE FOUR SIERRA, eight miles out to the West, we will be approaching on a forty-five for a downwind left approach to Runway Three Four, full stop, Willows."

This is one of several typical arrival announcements to other aircraft in an airport area, in this case, Willows-Glenn County Airport (WLW) UNICOM on 122.8.

The pilot identifies using the aircraft model and the last three alphanumeric characters of the registration number, direction with reference to the field, the type of approach, and that he or she intends to stop, as opposed to "fly a low approach" or "do a touch and go."

The one or two letters at the end of the reg-

istration number are spoken phonetically, as in "HOTEL" for "H."
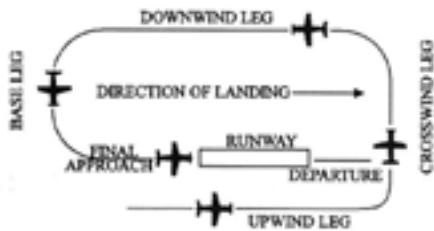
When one aircraft makes an announcement and yet another aircraft has intentions to land at or depart from that airport, the other pilot will speak up and say where he is and what his intentions are. They will then coordinate their activities on the frequency.

❖ Traffic Patterns

As you listen, you will hear self-announcements when an aircraft is about ten miles out from a nontowered destination airport. You will also hear "Upwind," "Crosswind," "Downwind," "Base," and "Final" as the aircraft progresses in the traffic pattern. These are standardized terms. Please see the Traffic Pattern graphic. There is a much better one at **www.aopa.org/asf/publications/sa08.pdf** – a 745 KB, 16 page PDF file entitled *Operations at Nontowered Airports*. **www.geocities.com/cfidarren/r-radiocommnta.htm** also has a traffic pattern diagram which contains useful examples of communications used at different points in the pattern.

"Willows Traffic, SKYLANE SEVEN CHARLIE BRAVO, Right Downwind, Runway Three Four, Willows."

This is typical of an announcement for an aircraft entering the Downwind leg of the pattern.

❖ Approach and Departure Control

A portion of nontowered airports are located within a TRACON (Terminal Radar Approach Control) area. If an aircraft chooses to depart under Instrument Flight Rules (IFR), rather than the more common Visual Flight Rules (VFR) from such an airport, the pilot will contact Departure soon after leaving the runway, much like an airliner departing from a busy towered airport. For IFR and VFR info see: **www.pilotage.com/features/church0898.htm** and **http://stoenworks.com/VFR%20flight.html**

If a nontowered airport is not located within a TRACON area, the local Air Route Traffic Control Center (ARTCC) Low Altitude Sector controller for that area may take over the Approach and Departure functions for an IFR flight normally associated with a TRACON. The Controller may even be available for Clearance Delivery while the plane is still on the ground. The ARTCC groundside of the communication is accomplished via unmanned Remote Communications Air/Ground Facilities (RCAGs) and the controller may be

Unlike airports with Control Towers, UNICOM stations can be located in less prominent places like this small building at AUN. The quarter-wave ground plane antenna is there, but can't be seen against the tree.

hundreds of miles away.

An example is Haigh Field Airport "Orland" (O37) where the AirNav.com listing says: "APCH/DEP SVC PRVDD BY OAKLAND ARTCC ON FREQS 132.2/350.3 (RED BLUFF RCAG)." Of course, civilian aircraft may only use the VHF frequency. RCAG maps: **http://freqofnature.no-ip.com:8080/faa/index.php**

When an IFR aircraft, controlled by an ARTCC or a TRACON, gets close to a nontowered destination airport, the controller will say: *"Change to advisory frequency approved."* At this time, the aircraft uses the airport UNICOM frequency to make his initial arrival announcement.

❖ Other Announcements

Taxi announcements are made prior to taxiing and prior to taxiing onto the runway. A departure announcement is made when departing the pattern. The taxi and departure announcements may be hard or impossible to hear unless close enough to the given airport.

Other types of announcements may be heard on UNICOM frequencies as well. Here are some examples.

Release of skydivers: *"Cloverdale Traffic, JUMPER FOUR EIGHT SIX, jumpers away, one three thousand feet and below, Cloverdale."*

Law enforcement: *"Oroville Traffic, CHP TWO THREE, we are working on a situation just two and a half to the southeast at four thousand five hundred."*

Passing through: *"Nevada County Traffic, CESSNA SIX ZERO YANKEE, we are about three and a half miles to the North, we are going to pass overhead North to South, five thousand five hundred feet."*

Passing through big time – Rio Vista Municipal Airport (O88) is near Travis AFB (SUU) in Northern California. For safety reasons, announcements by military aircraft can be heard on Rio Vista UNICOM 122.8. Example: *"Rio Vista Traffic, QUEST FOUR SIX, Heavy, DC-10, overhead Rio Vista turning to the west, direct Travis, descending from three thousand to eighteen hundred, Rio Vista Traffic."*

❖ DXing / Logging UNICOM

It can be an interesting challenge to see how many airports you can log for each of the UNICOM frequencies as pilots make their announcements. With an antenna (such as a scanner discone) mounted ten to twenty feet off the roof, aircraft should be receivable out to at least 60 miles, often many more, terrain and obstacles permitting.

The full U.S. map at **www.gaservingamerica.org/artwork/interactive_map/public.htm** uses dots to show locations of public-use airports, towered and nontowered. It will give you an idea of the airport density for your area.

To facilitate DXing UNICOM transmissions, or simply to better familiarize yourself with the airports in your area, consider the following: Go to **www.airnav.com/airports** and click on "Advanced Search."

At step 1, for best distance and direction results, enter the Lat and Long for your monitoring location. If you don't know that, enter the airport identifier for the airport nearest to you or your ZIP code.

At step 2, start by checking only "Airports" and "Public" in order to limit search results where there may be many airports.

At step 3, enter your search radius parameters. Selecting "statute miles" rather than "nautical miles" makes the distances easier to relate to.

Depending on how many airports are in your area and your maximum desired search radius, you may need to do this search in two or more increments, since AirNav only offers a maximum of 50 returns at a time, an unfortunate limitation – but it is free and a great resource.

The searches can be copied and then pasted into an MS Word document. The second and subsequent searches can be pasted right in after the first one for a continuous search result that can be saved.

For each airport, it shows the airport ID, the city, the airport name, and the distance and direction from the search radius center. Example for a single airport: MYV MARYSVILLE, CA YUBA COUNTY AIRPORT   26.1 mi WSW

Each airport in the list will have a link that, when on line, opens AirNav.com info for that specific airport – by holding Ctrl and clicking on the link icon.

For those who don't have MS Word, Windows PCs all come with Notepad and WordPad. Use Notepad to copy your AirNav searches into since WordPad is not up to the task. The result isn't as pretty as the MS Word method and there are no active links, but it's still quite useful.

Whether you use MS Word, another word processor, or Notepad, all entries can be edited. That is, once you log airport traffic on your scanner for a given airport, you can enter the frequency, the date, or other information of your choice.

❖ Temporary Towers

Should a nontowered airport in your area have an air show, an aircraft activity, or a community event that brings in many aircraft, a temporary, portable FAA Control Tower may be put into operation. Its frequency will be different from the UNICOM frequency.

There may also be a temporary ATIS (Automatic Terminal Information Service) set up to transmit pre-recorded and periodically updated airport information as well as a temporary Ground Control frequency. All these will show up somewhere in the 118-136 MHz band.

It is not uncommon for a somewhat quiet airport to become very busy with lots of communications. An article in your local newspaper may give you advance notice. Controllers often demonstrate amazing rapid-fire skill during the peak of air traffic. It can be quite exciting.

See you next time. Email comments and questions.

Your FAQs Answered

In the online world "FAQ" stands for Frequently Asked Questions. This month, I'd like to apply this concept to longwave radio listening. As with any corner of the radio hobby, longwave has its own share of jargon and assumptions that are tossed about by seasoned listeners – often with little thought given to the newcomer. This month's Q&A format should help unravel some of those mysteries and promote a better understanding of the basement band. Following are some of the most common questions I receive from *MT* readers:

Q: What is the best antenna to use for longwave?

A: The choice of an antenna depends on your receiving objectives and the conditions at your location. In a rural setting with low interference levels, a "random wire" of 100 feet or more can be quite effective. These antennas can be rather noisy when used in an urban or suburban environment, however.

In noise-challenged locations, a compact active antenna is often a better choice. An active antenna's smaller size makes it less of a "noise collector" – thus improving the signal-to-noise ratio of received signals. An active antenna is essentially a short whip (1 meter or so) attached to a pre-amplifier circuit. The amplifier is intended to make up for what the antenna lacks in length. For best performance, use an active antenna specifically designed for longwave.

If you want directivity in your reception, a loop antenna should be considered. Loops allow you to null out man-made static, or "pest" beacon signals that may be covering a station you want to hear. A drawback to loops is that you might miss a signal that is not in the favored plane of reception as you tune through the band. Serious listeners often use an omni-directional antenna such as an active whip for general tuning, and then switch to a loop to focus on a particular signal that may be down in the "mud."

Q: What is WWVB and why is this station necessary with WWV transmitting on several HF frequencies?

A: WWVB (60 kHz, Ft. Collins, CO) is a sister station to the well-known time station WWV that transmits at 2.5, 5, 10, 15 and 20 MHz. Like its HF counterpart, WWVB transmits time signals, but they are not broadcast in voice. Rather, WWVB transmits an encoded data stream that can be interpreted by specialized receivers, test equipment, and even some consumer-grade clocks.

WWVB's 60 kHz signal is also used as a frequency standard by many laboratories and power utilities to maintain the calibration of their equipment to exacting standards. Although some of these functions could be carried out on HF, variables in HF propagation can cause delays or distortions that are unacceptable to some users. Low frequency signals travel primarily by ground wave, and are far less susceptible to such changes.

Q: What is the lowest frequency man-made signal?

A: This distinction used to go to the U.S. Navy's Project ELF transmitters at Clam Lake, Wisconsin, and Republic, Michigan, which operated at 76 Hertz (less than 1 kHz). Currently, the Russian Alpha navigation system operating around 15 kHz is the lowest man-made signal that I am aware of. There are a few experimental stations that have operated from time to time around 9 kHz.

Q: How can I get a QSL (confirmation card) for hearing a longwave beacon?

A: The first step is to positively identify the station. A beacon guide, such as the *BeaconFinder II*, P.O. Box 56, West Bloomfield, NY 14585, can be used for this purpose. In most cases a guide will indicate not only the city where the beacon is located, but also the air facility that the beacon serves. A brief letter written to the "NAVAIDS" personnel of this facility will often bring results.

The operators of beacons don't generally have QSL cards to issue, so you must include a "prepared form card" or "PFC" with your request. The PFC should show the ID of the station, date and time heard, frequency, etc.

A space should also be included on the PFC for the Engineer-in-Charge to sign the card, and fill in any other pertinent details about the station (power output and antenna type, for example). Always be sure to include a self-addressed, stamped envelope with any QSL request. Look at past issues of *Below 500 kHz* for some fine examples of PFCs created by *MT* readers. Figure 1 shows one such example.

Q: What are the warbling tones I hear between 285 and 325 kHz?

A: You are likely hearing some of the Coast Guard's Differential GPS (DGPS) stations. These retrofitted beacons are used to send correction signals to Global Positioning System users in the vicinity of the station. Although GPS is quite accurate on its own, the DGPS signals provide even better performance for mariners operating in congested areas such as in harbors. The transmission mode for DGPS is known as Minimum Shift Keying (MSK) and a "DGPS-ready" receiver must be used to decode it. DGPS stations are very
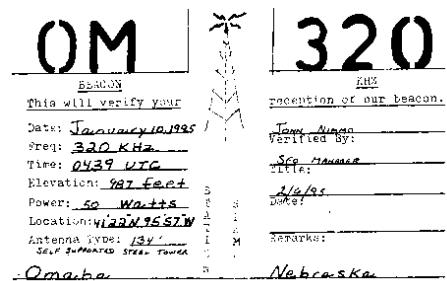
Figure 1. QSL Card for non-directional beacon reception (Allen Renner, PA)

common along coastlines, where marine beacons were formerly operated. The FAA has also been experimenting with DGPS technology for flight applications.

Q: Why do Canadian beacon IDs often begin with a "Y"?

A: I had to check with *MT's* Jacques d'Avignon for a definitive answer on this one. Under International Civil Aviation Organization (ICAO) rules, CYxx is assigned to Canadian airports. When it comes to airport beacons, however, the "C" is dropped for brevity. For example, "CYPQ" is the identifier for Peterborough airport, but the airport beacon transmits "YPQ." The Kingston airport identifier is "CYGK", but the beacon sends "YGK."

What's the significance of the last two letters in a 3-character ID? "Usually none," reports Jacques. The majority of these IDs were assigned during World War 2, and for security reasons, characters were chosen that give no clue as to the airport location.

Another category of Canadian beacons are those that use a 2-character ID. These beacons are typically *not* associated with a major airport, checkpoint or other prominent location. Because many of these sites were established after the war, their IDs sometimes provide a hint as to their location. The Vancouver beacon (VR/266 kHz) is one example.

Finally, we have the letter/number combinations such as F9 or 2U. These IDs are normally assigned to *privately owned* beacons at smaller airfields. Today, there are also many beacons in Canada that begin their IDs with "Z." These were formerly single letter beacons, which have been phased out to eliminate possible confusion with beacons in other regions using the same letter. The *BeaconFinder II* includes a listing of new "Z" beacons and their former IDs.

❖ Your Turn

There are many more questions we could address in a column such as this, but we've run out of space for this month. How about sending in your questions for a follow-up FAQ column? You can direct your questions to the e-mail address in the masthead.

See you next month!

OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller
georgezeller@monitoringtimes.com

Thanksgiving = Pirate Radio

Most pirate DXers are aware that pirate transmissions on shortwave always appear in large numbers around major holidays. Our big holiday in November is Thanksgiving, and the multi-day holiday always increases the volume of pirate activity on the bands.

So, if you are DXing for pirate broadcasts, the Thanksgiving weekend is an excellent time to tune around the 6925 kHz area. Further, a handful of pirates tend to cluster around Veteran's Day, another United States holiday that appears during November.

❖ Pirate Reception on Internet

Several times each year, various *Monitoring Times* readers write in to bemoan the fact that they have not been hearing pirate radio broadcasts on shortwave. For those who find themselves among that group, Europirate **Radio Alpha Lima International** has posted a novel new web site that contains over the air audio reception of many dozens of shortwave pirate radio stations. The audio comes via a RealAudio stream on the internet. You can check out these streams so that you know what pirate radio broadcasts sound like. The URL for this informative service is at **www.alfalima.net/audio-pirates.htm**

❖ WBNY vs WBCQ

A minor feud developed during the early fall months between two unlikely characters: Commander Bunny of **WBNY** and Alan Weiner of **WBCQ** radio. During his regular Alan Weiner worldwide broadcast on the licensed 7415 kHz **WBCQ,** Weiner criticized the programming and technical creativity of some pirate operators who use upper sideband to broadcast music. Instead, he suggested that they ought to purchase broadcast time on the widely heard **WBCQ**.

Commander Bunny at **WBNY**, in his spare time when he was not running for President of

the United States, rebroadcast some of Weiner's remarks repeatedly on a pirate basis. The production was structured to make fun of Weiner's criticism of some pirates. Of course, Weiner's track record as a pirate operator in the old days made this small feud somewhat ironic.

❖ ACE Returns as a Web Site

Longtime pirate radio authority Kirk Baxter provides good news this month. The Association of Clandestine Radio Enthusiasts, which ceased publishing its monthly pirate radio bulletin a couple of years ago, has returned in the form of an internet web site. This web site includes an archive of the excellent Free Radio Weekly newsletter, which still provides the most detailed weekly listing of recent pirate radio activity in the radio monitoring hobby. Among the many other new features on The ACE web site is an archived collection of Pirates Week podcast broadcasts produced by veteran North American pirate Ragnar Radio. You will certainly want to check out the new ACE web site, THE ACE online, at **www.theaceonline.com** on your internet dial.

John Cruzan's longstanding excellent pirate radio web site, the Free Radio Network, remains at its traditional spot of **www.frn.net**. Pirate radio DXers benefit from these significantly expanding internet web sites, which complement each other.

Veteran DXer and shortwave publisher Martin Schoech announces that his pirate radio address list remains available at **www.schoechi.de/pwdb-emb.html** His amazing web site also is an original source for the excellent *Clandestine Radio Watch* newsletter. Martin notes that the full address list is available only via a two year subscription that costs $6.00 US. For more information you can contact Martin via his *radio@schoechi.de* e-mail address.

❖ BLANDX Returns

Another veteran comedy presence in the shortwave radio hobby has returned. Don

Moore's hilarious *BLANDX* parody of DX bulletins is now up on an internet web site for all to see. If you want to see some funny stuff, the URL for this service at **www.blandx.com/hh/famousdxers/fdxcmenu.html** is the place to go.

Only some of the humor is related to pirate DXing. You can even see the notorious series of "Famous DXer" shortwave cards, designed to be just like baseball cards. Among the individuals who made the deck of DXer cards is none other than Grove Enterprises President Bob Grove. Glenn Hauser also is in there, as is your own *Outer Limits* editor. You'll have a smile on your face after you visit the new *BLANDX* web site.

WHAT WE ARE HEARING

Monitoring Times readers heard twemty different pirate radio stations once again this month, despite high static levels during the summer and early fall. You can hear them, too, if you use some simple techniques. Pirate radio stations never use regularly announced schedules, but shortwave pirate broadcasting increases noticeably on weekends and major holidays. You sometimes have to tune your dial up and down through the pirate radio band to find the stations, but more than 95% of all North American shortwave pirate broadcasts are heard on **6925 kHz**, plus or minus 30 or 40 kHz.

Captain Morgan- Twilight Zone TV audio and rock music are still their usual fare. (None, send loggings to the Free Radio Network)

4Q Radio- This new rock music pirate with the pornographic identification has returned again. (None announced)

Kracker Radio- Kracker's rock music programs were transmitted several times during the summer. (Belfast)

Liquid Radio- They are a new one that plays techno dance music, but they are a different station from the veteran **WMPR**. (None, but has replied via the FRN)

Long Range Radio- They are a new pirate featuring comedy material and parody ads. Despite the fact that they are new, they have been on a few times already. (None)

MAC Shortwave- Paul Star's authentic replica of top 40 radio formats of the 1960s remains on variable pirate frequencies such as 3275, 6850, and 6925 kHz. (macshortwave@yahoo.com)

Northwoods Radio- Their distinctive "loon call" interval signal generally leads in to a program of rock music "from the Great Lakes." (northwoodsradio@yahoo.com)

RPR- This new rock music station uses a slogan of "real pirate radio." (Unknown)

Radio 6X- This new rock music pirate has now been heard with several broadcasts. (Still Unknown)

Radio Ice Cream- The Ice Cream Man mixes rock music with excited conversations by children who are

Promoting Ham Radio

There is a fairly predictable ebb and flow to most ham radio clubs. For example, most clubs in the United States and Canada probably hold their last regular business meeting of the year in November. Why? Because they either cancel the December meeting altogether due to holiday pressures or they devote that meeting date to the club's annual holiday party.

That said, many clubs then use the November meeting to give some thought to planning the activities for the coming calendar year. But, after locking down the menu for Field Day and scheduling a few car pools to nearby hamfests, what else is YOUR club up to?

This month I would like to challenge folks to get their clubs to commit to some serious planning for promoting amateur radio to the general public in the coming year. What can clubs (and even individuals, in some cases) do to bring ham radio into the forefront of the public's mind?

Okay, so what got this particular bee under Old Uncle Skip's bonnet? A few weeks back I was walking into a facility with my dual band handheld strapped to my waist. This happened to be a place with a guard and a metal detector. (I do that a lot…Don't ask!) The guard looked at my rig and said "That's the biggest cell phone I've ever seen." As I gathered my gear up I briefly mentioned that it was a ham radio transceiver. He laughed a bit and said, "I didn't think anybody did that anymore."

I didn't have the time, at that point, to give the man a long spiel about how amateur radio helps folks all around the world every day (not to mention that it is fun), but I can remember a time when I didn't run into so many folks that think ham radio is extinct.

We have nobody but ourselves to blame for this state of affairs. Of course, organizations like The American Radio Relay League (ARRL) do yeomen's work trying to get the message out about ham radio. But, if we are honest with ourselves, all too many of us have become a bit insular about our hobby in recent years. We all need to get out of this rut and get amateur radio back into minds of the populace. If our clubs can take up the effort to further promote amateur radio, we will not only have our hobby back in the public eye, but we may even find quite a few new faces showing up at future meetings.

Since I issued this challenge, I would be remiss if I did not try to toss out a few ideas as to how you and your club might go about spreading the word about ham radio. Some of these are going to be common stuff, but if you have read this column for any length of time, you know I am going to throw a few curve balls just to keep you on your toes.

❖ Creative Recycling

One of the "joys" of middle age is that I find myself sitting in the lobbies of a few more doctors' offices than I did when I was younger. So it goes. I am somewhat perturbed to find that many of the magazines sitting in those office lobbies date back to when I was much younger as well.

Your club may want to institute a policy of having everyone bring in any fairly recent back issues of *QST, CQ*, (even *MT* with the "Ham Bands" column prominently dog eared) they no longer need. Distribute the resulting stack-o-mags amongst those members who figure they will find themselves in a doctor, dentist or other office with a waiting room over the next month, and have them add this ham radio related literature to the stacks of five year old gossip and glamour magazines.

If you want to get really creative, make up some stickers with information about your club (meeting times, locations, website, etc.) and use these to cover up the spot on the magazine cover where the original owner's name and address had appeared. You might also stick a copy of your club newsletter in as an insert.

Since I get the annual CD ROMs of both *QST* and *MT*, I have no problem parting with my paper issues on a regular basis. As a matter of fact, if I had been carrying my laptop bag into that particular facility I mentioned earlier, I probably would have handed an issue or two to that guard for him to read on his break.

❖ Speaking of Subscriptions

I know most clubs have rather meager coffers these days. I bet it is hard to even get the dues to stretch far enough to pay for the meeting's coffee and cookies. But if you can squeeze a few extra dollars out by passing the hat at a meeting or two, why not purchase subscriptions to one or more ham radio oriented magazines for your local public or school library? If your library already has subscriptions, you can then consider buying the back issue CD ROMs and gifting them to the library for their archive collection.

❖ School Demonstrations

Ham radio can be presented in a school setting in any number of subject areas. There are online resources to help you show teachers how amateur radio can fit into their school's curriculum. One such resource can be found on the ARRL Web Site at: **www2.arrl.org/FandES/ead/teacher/curriculum.html**

Using the resources of your club, it should not be too hard to find a point of contact to get an introduction to teachers or administrators in your local school district. I have done a number of school programs over the years in both elementary and high school settings. I have always found schools to be most receptive once I was able to show them how amateur radio can be used to energize a class about related subjects such as geography, communications, and science.

Embarking on this route involves a great deal more than just demonstrating how to talk to someone not in the classroom. Teachers are going to expect a formal presentation, not more than an hour or so in length, that covers topics that will reinforce regular classroom subjects. You need to coordinate such things as power and antenna placement well in advance of any demonstration. Don't give up if you can't actually demonstrate radio communications. There is still a lot to talk about just using a blackboard and chalk.

Then again, if your club builds up good rapport and gets a bit of a reputation as being a "go to" presentation resource, you may get to the point that you can do a full-out Amateur Radio

on the International Space Station (ARISS) presentation and have the kids talk with an orbiting astronaut or two.

❖ Public Service and Public Events

I have often talked in this column about the value to hams participating in activities such as providing communications for walk-a-thons, parades, festivals, etc. This can be done either as a club or as part of an ARES or RACES assignment. It is all to the good; getting out in the public and helping out is part of the rent we pay as hams for our frequencies.

But have you ever stopped to think about how we look when we perform these services? Often we are just someone sitting in our car watching the walkers walk by. We can do better than that! My ARES group had large signs made up for our cars (bright yellow with red and black lettering) informing any passing event participants that the person sitting there with the radio was an Amateur Radio Operator providing event support. Every participating ham was also given a stack of handbills explaining the basics of ham radio as a community service and gave further information about how to find out more about the hobby. Over the years, more than a few folks became hams once they saw these handouts.

Now I know that not everybody who likes to talk to strangers on the radio feels all that comfortable talking to strangers face to face. You may want to hold a session at a club meeting to talk about how to present some basics while working public events. It wouldn't be all that hard to make up some simple 3x5 "cheat" cards to help people with their small group public speaking. Hams love to talk about ham radio with other hams. It shouldn't be too big of a deal to help shy hams talk about ham radio with potential hams as well.

❖ Press On

Any time your club does anything at all, even holding your monthly meetings, you should make an effort to get it into your local newspaper. Take some of the examples we have talked about. They are all worthy of taking the time to write a short press release and sending it in to any newspaper that is read locally.

Writing a press release is not too difficult. Here is a general format to follow.

On the top left side of the page type FOR IMMEDIATE RELEASE. All capitals and underlined. On the top right hand side of the page type in normal case letters – For more information contact: (add in your club's point of contact.)

Follow this simple heading with two or three short but clearly written paragraphs explaining what your club has done or what it intends to do in the future. If you can squeeze in a line or two about amateur radio's ongoing value to the community, then go for it. Try to keep things to one page. If the newspaper wants more they will contact you.

Send this to the address identified in the newspaper's masthead for such matters. More and more newspapers depend on e-mail and it is fine to use that as well, but I find I still get best results with hard copy.

Here is another tip related to local papers. Read a few issues and get a sense of the names of the writers that specialize in local news and feature columns. Try to arrange a short meeting with such folks. They will usually be happy to know they have a dependable source of local news and they will also give you hints on how to provide the information in a format that the writer can then turn into copy.

❖ Here is an Oldie but a Goodie

I bring this up because it is directly related to how I became a ham. While I had a strong interest in playing radio since grade school, I never got around to sealing the deal and getting my ham ticket until one November day back in the mid '70s. I was walking through my local shopping mall when I saw a table set up in a corner with a large sign saying "Send Holiday Greetings Around the World via Amateur Radio." Seated at this table were a group of folks I eventually came to know as the West Jersey Radio Amateur Club. The club had HF and 2 meter stations set up and were taking messages on ARRL Radiogram forms and getting them out on the traffic nets. I sent a few messages to friends overseas and then started asking a lot of questions. I attended their next club meeting (incidentally, their holiday dinner party) and then enrolled in their Novice class the following spring. I became WN2GHA and the rest is history.

Yeah, I know everybody has cell phone now, but the traffic nets are still up and running. There is still time to set something up during the shopping rush.

Or maybe you could take a couple of 2 meter radios to a local hospital and have the kids on the wards talk to Santa at the North Pole.

Get the idea, folks? Make it a club imperative to get the word out about amateur radio. And don't forget to have fun while you're doing it!

I'll see you on the bottom end of forty meters.

UNCLE SKIP'S CONTEST CALENDAR

ARRL Sweepstakes Contest (CW)
Nov 3 2100 UTC - Nov 5 0300 UTC

NA Collegiate ARC Championship (CW)
Nov 3 2100 UTC - Nov 5 0300 UTC

Kentucky QSO Party
Nov 10 1400 UTC - Nov 11 0600 UTC

ARRL Sweepstakes Contest (SSB)
Nov 17 2100 UTC - Nov 29 0300 UTC

Run for the Bacon QRP Contest
Nov 19 0200 UTC - 0400 UTC

NA Collegiate ARC Championship (SSB)
Nov 17 2100 UTC - Nov 19 0300 UTC

CQ Worldwide DX Contest (CW)
Nov 24 0000 UTC - Nov 25 2400 UTC

ARRL EME Contest
Nov 24 0000 UTC - Nov 25 2359 UTC

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delighted that they are receiving ice cream. They are good verifiers. (Belfast)

Radio Jambu International- Rock music and comedy are a traditional pirate format, and that holds forth here. We correct a spelling error for the station ID that was printed last month. (Belfast)

Sycko Radio- Pirate radio discussions and sketches from Beavis and Butthead are often heard here amid their rock music, along with a new **WSKO** call letter identification. (syckoradio@yahoo.com)

The Crystal Ship- The Poet still programs the "Voice of the Blue States Republic," with rock music and leftist political analyses. His many frequencies include 1710, 3346, 3275, 5386, 6875, 6925, 7576, and 9057 kHz. (Belfast and tcsshortwave@yahoo.com)

Truck Driving Man- This new station says that instrumental music is their normal format, so you don't hear much singing here. (None announced)

Undercover Radio- Dr. Benway's shows "From the middle of nowhere," are a mix of rock music and narrative tales. (Merlin and undercoverradio@mail.com)

Voice of Captain Ron Shortwave- Captain Ron still hosts a rock music program. (captainron6955@hotmail.com e-mail, and this replaces a former and now invalid address)

Voice of the Rock- This veteran special event pirate has returned with rock music. Broadcasts a few years ago were supposedly from a remote "grenade" transmitter on an unidentified rock. (Belfast)

WBNY- Commander Bunny's sudden war with Alan Weiner at WBCQ may or may not be a parody during his campaign for President of the United States. (Belfast and has announced rodentrevolutionhq@yahoo.com)

WBCQ Relay- An unidentified pirate has been relaying portions of the Radio Timtron segment that is broadcast on 7415 kHz by **WBCQ**. (None)

WHYP- The James Brownyard memorial station remains among the most popular stations on the pirate bands.

WMPR- When you hear techno rock "dance music" you are probably tuned into "Micro Power Radio." (None, QSLs only rarely at the Kulpsville Winter Shortwave Listeners Festival).

❖ QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations. The cash defrays postage for mail forwarding and a souvenir QSL to your mailbox. Letters go to these addresses, identified above in parentheses: PO Box 1, Belfast, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; Casilla 159, Santiago 14, Chile; and PO Box 293, Merlin, Ontario N0P 1W0.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. The best bulletin for submitting pirate loggings for possible QSL is the e-mailed Free Radio Weekly newsletter via EInsinge@vrxus.JNJ.com. A few pirates will sometimes QSL reports left on the outstanding Free Radio Network web site, at www.frn.net.

❖ Thanks

Your loggings and news about unlicensed broadcasting stations are always welcome via 7540 Highway 64 W, Brasstown, NC 28902, or via the e-mail address atop the column. We thank this month's valuable contributors: Brian Alexander, Mechanicsburg, PA; Skip Arey, Beverly, NJ; Kirk Baxter, North Canton, OH; Jerry Berg, Lexington, MA; Artie Bigley, Columbus, OH; Wendel Craighead, Prairie Village, KS; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; William T. Hassig, Mt. Prospect, IL; Harry Helms, Smithville, TX; Ed Insinger, Summit, NJ; Ed Kusalik, Coaldale, Alberta; Chris Lobdell, Tewksbury, MA; Michael W. Maher; no QTH; Larry Magne; Penn's Park, PA; Greg Majewski, Oakdale, CT; A. J. Michaels, Blue Ridge Summit, PA; John Poet, Belfast, NY; Chuck Rippel, Chesapeake, VA; Martin Schoech, Eisenach, Germany; and Bob Wilkner, Pompano Beach, FL.

Some Useful Indoor Antennas

It's hard to beat a good outdoor antenna for pulling in the signals you want to hear. But there are situations where time, money, or restrictions on outside antennas prevent adding an outdoor antenna to your station. In such cases your thoughts may turn to the possibilities of antennas that can be used inside a building. And, if the antenna is small enough to put in your suitcase, it can be used when traveling, too. This month we discuss building an indoor antenna that is actually small enough to put in your pocket!

❖ You Have Choices

Unless you are in a metal building, or the depths of a large building, there are several kinds of antennas that will likely provide you with useful indoor service. Probably the simplest indoor antennas are the telescoping whips that we find on many scanners and portable AM-FM, shortwave receivers. These work fine for many applications. Often scanners can pull in all the local signals of interest to you with nothing more than a foot or two of wire for an antenna. For high-frequency (HF) or the lower frequencies, a 10 to 20 or more ft wire simply laid out along the floor near the wall or strung along the ceiling will often produce useful results. I've even had modest success on HF by stringing a wire on the ceiling of a basement room. Its performance was not great, but it was all I could put up at that time, and I was able to talk with the local hams using it.

Unless your building has a metal roof, an attic is often a good place for an antenna. Even in wooden buildings there are usually metal conductors, such as electrical wiring and appliances, throughout the structure. These can both block and distort an antenna's radiation-reception pattern. For this reason the performance of an indoor antenna, especially beam antennas, is likely to be unpredictable.

We're all familiar with the ferrite-core loop antennas used in AM-broadcast receivers. Ferrite-core, loop-based, active antennas (active antennas are discussed below) are available for various bands from LF to UHF. Open-frame loop antennas generally consist of a coil of wire, typically one to three feet in diameter, and a tuning capacitor. They are often placed on the operating desk next to the receiver. Both the open-frame and ferrite-core loops can often be used to advantage by positioning the antenna so that the null in the radiation-reception pattern reduces the strength of signals interfering with a station that we want to copy.

The low-resistance, high-Q, single-turn, large, tunable-loop (perhaps 3 to 4 ft or so in diameter) antennas work well indoors. AEA used to make one. MFJ has a similar loop, also. I've used the AEA model with it sitting on a table inside a wood garage, and its performance equaled a half-wave dipole I had outdoors. And that building had a metal roof!

Unlike most other antennas, all the loops mentioned in this month's column must be retuned as operating frequency is changed.

Whereas the AEA and MFJ low-resistance loops can be used effectively for transmitting as well as receiving, the ferrite-core loop and open-frame loop are typically used only for receiving.

Active antennas are often an excellent substitute for an outdoor, long-wire receiving antenna. In active antennas the actual antenna part of the device is a whip or length of wire. These devices are called "active" because they include an amplifier that increases the strength of the signal picked up by their short antenna element. Due to this amplification, active antennas will often bring in stations as well as a much longer outdoor antenna.

A downside to active antennas is that you may experience overload, desensitization, or inter-modulation distortion due to strong signals in your area. And don't try to transmit with an active antenna, or you will most likely destroy the transistors in it, or worse. Despite the potential problems, many people find active antennas to be quite useful receiving antennas.

❖ Let's Make an Active Antenna

This circuit (figs. 1A & 1B) is a slightly-modified version of one I offered in a column several years back. To help reduce problems from overloading the FET, I have added an RF gain control to the older circuit. The circuit shown in fig. 1 is quite simple, but it works from low frequency through medium frequency, including AM broadcast, and on through the high frequency (shortwave) band. The circuit requires only one capacitor, one resistor, one potentiometer (variable resistor), one FET transistor, a whip or a short length of wire as an antenna, a 9-volt battery, and a feed line.

If you're unfamiliar with electronic symbols, the pictorial diagram in fig. 1B shows how the parts are placed and wired in the circuit. An MPF-102 FET is used in the pictorial: if you use a 2N3819 FET instead, note that the base connections are different. The components for this antenna are available at electronic-parts suppliers such as Radio Shack®, and **www.**
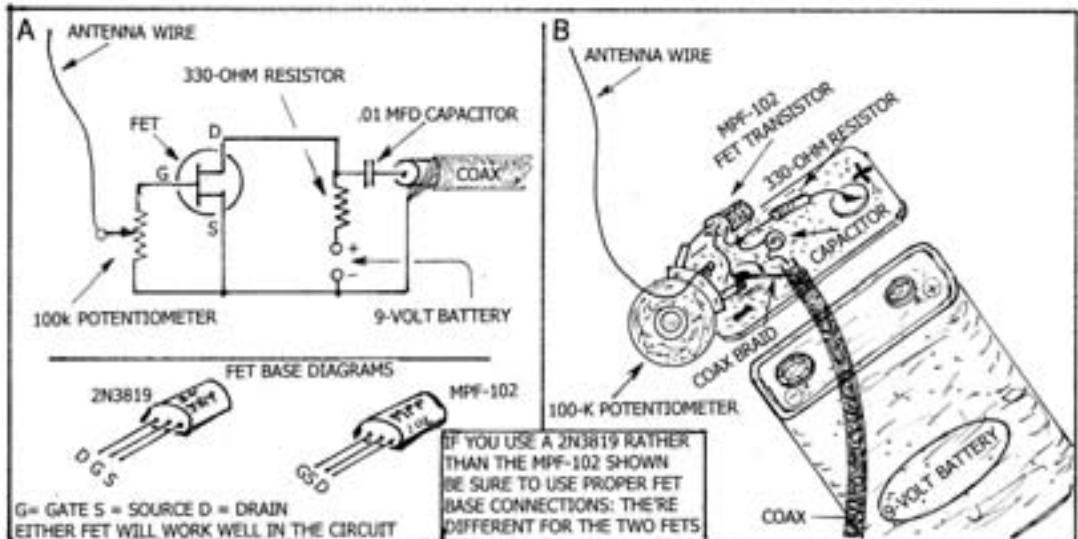
Fig. 1. Schematic circuit diagram for an active antenna (A), pictorial circuit diagram for the same active antenna (B).

danssmallpartsandkits.net/

It's best to solder all connections. But if you can't yet solder, then twisting the wires together very tightly should work. However, unless they are soldered they may eventually loosen. Wires must be clean to make a good connection. Don't overheat the parts by keeping the soldering iron on the part too long while soldering. Also, when soldering the connections to the transistor, hold the transistor leads with long-nosed pliers at a point between the transistor and the soldering iron. This reduces the possibility of heat damage to the transistor.

For the chassis for the circuit I used a connector from a discharged 9-volt rectangular battery. This will plug right onto a new battery. Or you can buy a new connector. If you want to keep the antenna's size down, use one of the miniature potentiometers. Or, you can omit the potentiometer and replace it with a 100k resistor:

RADIO RIDDLES

Last Month:

I asked: "What kind of radio antenna is designed so that it neither transmits, nor receives? And why would we even want such an antenna?"

Well, believe it or not, there are such antennas, and they are usually called "dummy antennas." Some made for the military were called "phantom" antennas: a name also currently used for some commercial antennas. Some dummy antennas are used for tuning

then connect the antenna wire to the end of the resistor that connects to the FET's gate.

The feed line from the antenna to your receiver can be coax, or short a pair of insulated wires twisted together. If you use twisted wires, the wire from the negative battery connection goes to the shell, or else ground part of the receiver's antenna connector. The other wire goes to the antenna connector's center connection. Any coax will work for the feed line, but the very thin coax, such as RG-174, is more flexible and convenient. Its high-loss rating is unimportant when using a short length.

❖ **Using the Active Antenna**

Make the antenna element a few feet long.

transmitters when it is desired that no signal be radiated while adjusting the transmitter. Others are used in conjunction with a low-level signal from a signal generator to achieve a good impedance match at the receiver's antenna-input circuit while doing maintenance adjustments on the receiver's internal circuits.

This Month:

OK, now you know what an active antenna is. Are there any inactive, or lazy antennas?

You'll find an answer to this month's riddle, another riddle, another antenna-related web site or so, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.

Experiment with different lengths to see what is best for you. If distortion or false signals occur, try setting the gain control lower. To turn the antenna off, unplug the battery when not in use.

Power Supplies for the BC-348

Last month, we powered up our BC-348 World War II aircraft receiver for the first time. I had intended to use a handy little salvaged power supply from my junk box as an external power source. However, I was disappointed in that the heater winding of its transformer turned out to be 12 volts. (My BC-348 heaters had been rewired from their original 24-volt configuration to run on 6 volts.)

I went ahead and used the supply for initial testing, adding a Variac to cut down its too-high plate voltage and a separate transformer to light the 6-volt heaters. Though I was happy to see that no smoke issued forth, the radio was essentially unresponsive. It did make some noises that sounded like atmospheric disturbance, but operating the band change switch, changing the tuning, or scratching the antenna terminal with a screwdriver had absolutely no effect.

I was anxious to begin troubleshooting, but my temporary power hookup, with its many clip-lead connections, was an inhibiting factor. When troubleshooting, one must be able to move the radio into a variety of different positions to access various test locations. That's hard to do when there are half a dozen or so clip leads to disconnect and reconnect each time!

Finding Parts for Internal Power

Since my idea for the external supply didn't work out, I decided to do what many restorers had done before me: build a power supply into the empty dynamotor well. (My radio, like most of its relatives, had lost its dynamotor back when World War II surplus equipment was just coming on the market and the hams and SWLs were converting it to plug-in power.)

The original dynamotor chassis was about 4" X 6". It had been mounted over a well about - 1/2" deep using 8-32 screws at the corners. The chassis for an a.c. supply could be cut to the same dimensions and fastened over the well using the same tapped holes that had accepted the dynamotor screws. There'd be room for a power transformer and choke on the top surface and adequate clearance for tie strips, small components and wiring underneath.

My first problem was to locate a suitable power transformer and choke. I had many examples of both in my junk box but, as luck would have it, all were either too big or too small. The transformer's 6-volt filament winding would have to supply about 2 1/2 amps and the high-voltage winding – specified as 600

volts (center tapped) by some sources – had to deliver over 100 mA. Of course, the choke also had to be rated at over 100 mA. The units I had on hand that were big enough electrically proved to be physically too big for the available space.

However, the Antique Wireless Association Annual Conference in Rochester, NY, was coming up, and a friend of mine with a *really* well stocked junkbox would also be attending. I put in a call and he promised to look – using his own BC-348 as a size reference. Not only did he come through with a nice-sized transformer, but I was also able to find an appropriate choke in the conference flea market.

Preparing the "Chassis"

To get the size and hole placement for the power supply chassis, I made a template from a piece of cardboard liberated from the back of a notepad. Drawing a rectangle on it just a little bigger than the required size, I cut it out with a

The empty dynamotor well on the BC-348 chassis.

scissors. Then I cut it down, bit by bit, on both dimensions until it was a good fit.

To get the placement for my mounting screw locations, I centered the template over the dynamotor well and duct-taped it down. Then I applied rubbing pressure with my fingertips over each of the tapped holes until its outline began to show through the cardboard. Adjusting a desk lamp for crosslight, I could now see good representations of the openings. Carefully estimating the center of each opening, I used a nail to make holes through the cardboard at those locations.

Fitting a cardboard template over the dynamotor well.

I found some sturdy 1/8" composition board to make the power supply chassis and, using the template as a guide, cut it to the correct size on my table saw. Then the template was taped to the board and I marked each one of my mounting screw locations by making a puncture with a nail hammered through each of the previously-made holes in the template. Drilling holes for the screws was an easy matter, and I made them slightly oversized to compensate for any small errors in placement.

After making sure that the board was a good fit and all the mounting holes lined up with the tapped holes at the dynamotor well, I began to lay out the power supply parts. It was an advantage to have this "chassis" made of composition board rather than metal. The material was easy to drill and far more rigid than sheet metal might be. And there was no need for a ground in the power supply circuit because, in the BC-348, the B minus is "floating."

The Power Supply Circuit

The power supply circuit employs a standard full-wave rectifier. I'm including a schematic of the BC-348 power supply that was recommended in a popular surplus conversion handbook of the mid 1940s (Figure 1). This is essentially the circuit of my supply, except – to save space and power – I used a couple of
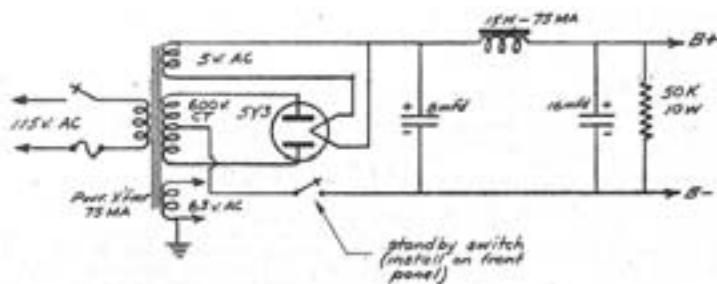
Figure 1. Suggested BC-348 power supply from 1940s conversion publication (see text).

Figure 2. Diode replacements for tube in Fig. 1. Top lead goes to plus side of filter; bottom lead to minus.

silicon rectifiers (Figure 2) instead of the 5Y3 rectifier tube.

Also, though my choke was unmarked, I'm pretty sure it isn't as large as the 15H size specified on the schematic. In view of that suspicion – and since high-value electrolytic filter capacitors are common and inexpensive – I substituted 33 uF units for the 8 and 16 uf sizes specified.

By the way, I don't think that the 75 mA size specified for the choke and transformer in Figure 1 would be quite adequate. My set, at least in its current condition, is drawing about 120 mA. There's also no need to drill a hole in the front panel to install a standby switch that lifts the transformer center tap. Standby circuitry is built into the BC-348 and can be accessed through a couple of tab connectors on the rear plug. We'll get into that later.

With the power transformer and choke mounted on top of the chassis, the capacitors, bleeder resistor, and necessary terminal strips fit comfortably underneath. However, I did have to exercise some care to make sure that none of the parts were close enough to the edge to brush against the sides of the dynamotor well.

Firing up the completed power supply for testing, I found the plate voltage being delivered under load was over 50 volts too high. This wasn't unexpected, because the output of the transformer's plate-voltage winding was a little high, the internal resistance of the silicon rectifiers is a lot lower than that of a rectifier tube, and there are those oversized filter capacitors.

I don't know if you have ever priced new power transformers suitable for tube gear. But if you have, you know why we usually do our best to adapt the best used transformer we can get for our purposes. The trick often used to reduce plate voltage is to insert an appropriately-sized power resistor in series with the transformer's center tap.

I found, after some cut-and-try experimentation, that I was going to need about a 600-ohm 10-watt resistor for this purpose. The closest I could come out of my junkbox was a unit made up of four 2500-ohm 2-watt resistors wired in parallel. This composite resistor was of the correct ohmic value and could handle the power dissipation.
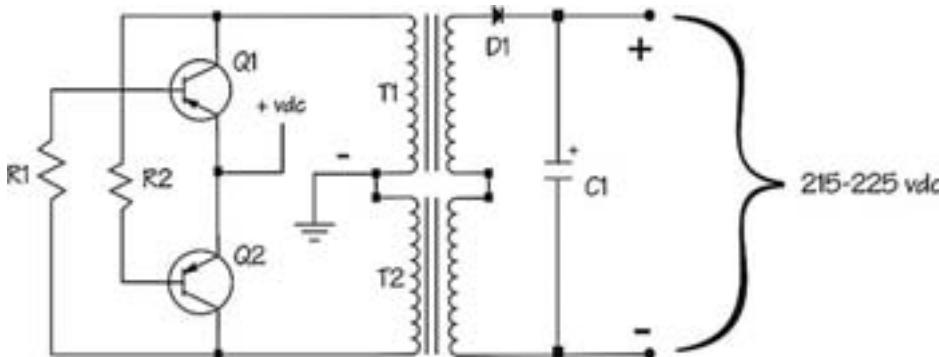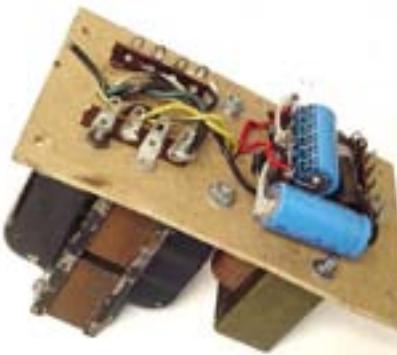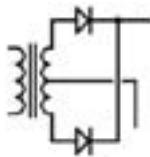
The power supply board is now almost ready to mount over the dynamotor well.

With the insertion of these resistors, my new power supply was operating the radio as well (or as poorly!) as my lash-up of last month. However, there was no way I could find room for the four resistors on my power supply board! So I wasn't yet able to install the power supply in the radio and had to resort to using it externally with clip leads connecting to the temporary resistors.

I've included a 600-ohm 10-watt resistor in my latest parts order. Once it arrives, I'll be able to find a spot for it on the power supply board – preferably on top of the board for good heat dissipation. Then I'll be able to proceed with the troubleshooting that I've had to put off for the last couple of months!

For the Purists: A Solid State Dynamotor

Perhaps you have a BC-348 that is mint and untouched, except for the dynamotor having been removed. You'd prefer to run it on d.c. and not make any of the wiring changes necessary to install an a.c. supply. Craig, N3TPM, has an answer for you. Using his circuit (Figure 3), you can build up a solid state dynamotor replacement for installation in the dynamotor well in much the same manner as the a.c. power supply just described.

Transformers T1 and T2 are low-voltage transformers with 120-volt primaries. They are hooked up in reverse so that the high voltage appears at the output. Use transformers with 12-volt, 2 amp secondaries for 12-volt operation; with 24-volt, 2 amp secondaries for 24-volt operation.

PNP power transistors are 2N6109 or equivalent. These must be heatsinked. Check the data sheet for your transistors to see if the heatsink tab is connected to internal circuitry. If so, and if your "dynamotor" is to be built on a metal panel or chassis, you'll need to add mica insulators under them.

Diode D1 is a 500-volt (or better), 2 Ampere unit (1N4007 or equivalent). Capacitor C1 is a 40-80 uF, 300-volt electrolytic. Resistors R1 and R2 are 10,000-ohm, 1-watt.

Remember, just as with the a.c. supply described above, the negative output is not to be grounded, but connected directly into the receiver circuitry as specified on the schematic.

We'll see you next month when, at last, we should be able to get into some serious troubleshooting!

Figure 3. N3TPM's circuit for solid state dynamotor replacement. See text.

GRE Raises the Bar Again!
MT First Look at GRE PSR-500

By Larry Van Horn, N5FPW, Assistant Editor Monitoring Times

I have been a scanner user most of my adult life and I can truly say the advances in scanner technology in the last three years have been remarkable. But what I didn't anticipate coming was last spring's announcement that General Research of Electronics (or GRE as they are more commonly known) was entering the scanner marketplace under their own label.

Most scanner pros know that GRE has been the OEM manufacturer of Radio Shack scanners for many years now. I dare say if you have been in the hobby for any length of time you will recognize some of the old favorites manufactured by this company – RS Pro-2004/5/6 series, RS Pro-43 handheld, and some of their more modern counterparts the Pro-96/97 and Pro-2055/2096 mobile/desktop scanners.

Now this fabled scanner company is releasing this fall and winter six new models

TABLE ONE: PSR-500 FREQUENCY COVERAGE

Freq Range Modu-(MHz)	Default Step (kHz)	lation
25.0000 - 27.4050	10	AM
27.4100 - 29.5050	5	AM
29.5100 - 29.7000	5	FM
29.7100 - 49.8300	10	FM
49.8350 - 54.0000	5	FM
108.000 - 136.9916	8.33	AM
137.000 - 137.995	5	FM
138.000 - 143.9875	12.5	FM
144.000 - 147.9950	5	FM
148.000 - 150.7875	12.5	FM
150.800 - 150.8450	5	FM
150.8525 - 154.4975	7.5	FM
154.5150 - 154.6400	5	FM
154.6500 - 156.2550	7.5	FM
156.2750 - 157.4500	25	FM
157.4700 - 161.5725	7.5	FM
161.6000 - 161.9750	5	FM
162.0000 - 174.0000	12.5	FM
216.0025 - 224.9950	5	FM
225.0000 - 379.99375	6.25	AM
380.0000 - 419.987500	12.5	FM
420.0000 - 450.000000	5	FM
450.00625 - 469.99375	6.25	FM
470.00000 - 512.00000	12.5	FM
764.00000 - 805.996875	3.125	FM
806.00000 - 901.987500	12.5	FM
902.0000 - 928.000000	5	FM
928.00125 - 939.987500	12.5	FM
940.00000 - 1300.00000	6.25	FM

Note: The scanner's frequency coverage is not continuous and does not include the cellular telephone, FM broadcast, VHF-TV low channels, or some UHF TV channels. Excludes by US federal law cellular telephone frequencies: 824-848.9875 and 869-893.9875 MHz.

– the GRE PSR-200/400/600 desktop/mobiles, and the GRE PSR-100/300/500 handheld scanners.

In late August I had a chance to sit down with company officials and engineers to talk with them at length about these new models, and was really surprised to learn about some of the new innovations that these new radios are bringing to the scanner marketplace. As part of this show and tell, the gang from GRE brought with them the latest version of their new GRE PSR-500 handheld scanner. Since that meeting GRE sent an even later version of the PSR-500 for *MT's First Look* to test.

❖ The GRE PSR-500 Advanced Digital Handheld

Recognizing that contemporary scanning receivers are difficult to program and use, GRE's engineers conducted extensive research to determine the functional requirements for an entirely new scanning receiver user interface. They call this new intuitive user interface the *Object Oriented User Interface* (OOUI).

It is based on the premise that, to a hobbyist, a scanner is easiest to use if all of the things that can be scanned are handled using common conventions for interaction between the user and the radio, at least to the extent that this is possible, given that the "things" that can be scanned are different from one another in either subtle or major ways.

In this new user interface design, they call "things" that can be scanned, Scannable Objects. Simply put, a Scannable Object is defined as something that can be scanned or monitored. These include:

· Conventional, non-trunked radio channels
· Trunk talkgroups used on a trunked radio system
· Service searches to search for a specific radio service
· Search ranges with upper and lower limits
· Spectrum Sweeper setups with band segments that can be enabled or disabled by the user

One of the goals of the Object Oriented User Interface is to make the scanner as easy to use as possible. The OOUI does this by treating all Scannable Objects the same, in terms of how they are created, edited, manipulated and grouped. Once you have learned how to create and store a conventional channel, you know most of what you need to know to create a trunking talkgroup, and so on.

❖ Case, Controls and the Antenna

The PSR-500 is a descendant of the popular RS Pro-96 scanner. But this isn't your daddy's Pro-96, so all other comparisons would be fruitless.

The PSR-500 case is smaller than the Pro-96 measuring Approximately 2.56(w) x 1.65(d) x 5.71(h) inches, 65 (w) x 42 (d) x 145 (h) mm and weighs in at 8.5 ounces (240 grams) without batteries and antenna.

The liquid crystal display (LCD) is part of an amber backlight system and consisting of four lines of 16 characters each, plus 13 display icons. The keypad is also part of this backlit system.

One of the most innovative features of this radio is its programmable, multi-colored, super bright LED. This tri-color LED can be configured to illuminate or flash when certain channels are active. You can see it from across the room and it is very bright in the car at night. Eight user-defined colors and brightness levels can be specified from thousands of possible combinations. The LED provides visual alerts when certain objects are active; e.g., blue could be used to signal activity on, say, a police channel, red on a fire channel, and so on.

There is only one knob on the top of the unit that controls volume (inner knob) and analog squelch (outer ring). There is also a headset jack and the BNC connector (50 ohms) for the antenna (flexible antenna included).

On the right side of the unit is a PC/IF jack and the left side has a jack for external AC power.

The keyboard (also part of the backlit system) consists of three soft keys, a function key and backlight key, numeric keypad, operations keys, and a five way pushbutton pad.
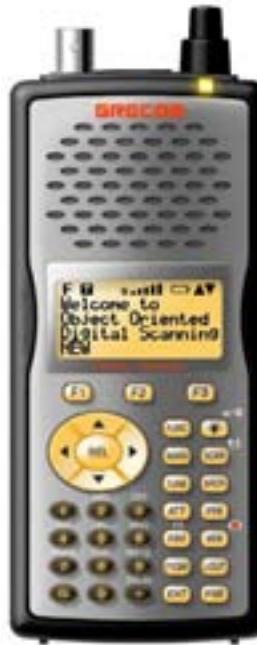
TABLE TWO: MISCELLANEOUS SPECIFICATIONS

- Eleven tuning steps.
- Triple conversion scanner.
- Attenuator (20 dB).
- 55 channels per second scan speed and 90 steps per second search speed.
- User defined service and limit searches.
- Key lock for safety
- Backlit LCD and keypad with dimmer.
- LCD contrast control
- Built-in power save function and low battery indicator on the LCD
- Frequency and channel lock-out review.
- Earphone jack (3.5 mm stereo).
- PC Interface/Clone jack (3.5mm stereo). Computer cable (GRE USB cable No. 30-3290)
- Memory Backup: No battery backup required. EEPROM used.
- Operating voltage: 6 VDC (4 AA cells)
- External power and charger voltage: 9VDC regulated via external/charger.

Note: Features, specifications, and availability of optional accessories are all subject to change without notice by the manufacturer. Information presented above was based on the test unit provided by the manufacturer.

❖ It's what is under the hood that counts.

Looking inside the radio we found a wonderful world of scanning capability. Here are some of the features that the PSR-500 offers.

- You might be familiar with Uniden's Close Call or Radio Shack's Signal Stalker RF capture technology. GRE's equivalent in its new scanners is called Spectrum Sweep. In head-to-head testing with Close Call and Signal Stalker, we found that Signal Sweep was an improvement in the quiet RF environment we tested it in.
- Flexible Free-Form Memory Organization – Memory is assigned as objects are created using a sophisticated internal file management system. You are not constrained to traditional bank/channel scanner memory layouts as you were with the older Pro-96. No memory is wasted as a result of bank/channel programming constraints. The scanner has sufficient main memory capacity to store over 1800 conventional channels, trunking talkgroups, search configurations and Spectrum Sweeper objects in any combination.
- Powerful and Flexible Scan List Functionality – Allows you to arrange, group and scan objects according to your preference, with no limit to the number or types of objects in a Scan List, and no limit to the number of Scan Lists an object can be a member of.
- GRE's Exclusive V-Scanner Technology – Allows you to save complete radio configurations within the radio for recall into main memory as needed in the field. This is similar to having a laptop computer and programming software available anytime. You can use V-Scanners to store configurations for different geographic areas or usage styles. Twenty-one V-Scanner folders are provided, each capable of storing over 1800 objects. Total memory capacity of main memory combined with V-Scanners is over 39,600 (1800+37800) objects.
- Menu Driven Programming with Context

MT Rating [four and 3/4 stars]

★★★★★

Sensitive Help – Each menu item provides a few lines of help text that provide assistance with programming and using the scanner.

• **Upgradeable CPU and DSP Firmware** – You can easily keep your scanner current with software enhancements as they become available with free upgrades from **www.greamerica. com**.

• **Remote Control Capability** – These scanners can be used with third party application software to remotely control a scanner from a personal computer. Uses GRE's 30-3290 USB cable in full duplex mode at six times the speed of previous scanner models for PC transfer and eight times the speed of previous models for radio-to-radio cloning.

GRE's exclusive Automatic Adaptive Digital Tracking instantly adapts the digital decoder to the digital modulation format of the transmitted signal, then analyzes the signal over 50 times each second and adapts to any subtle changes caused by multipath or fading. No cumbersome manual adjustments are required. In my test this worked most of the time for most of the P25 systems in the area.

CTCSS and DCS subaudible squelch coding is processed by the same powerful DSP chip that is used for P25 digital decoding. It provides fast and reliable decoding of subaudible squelch signaling with squelch tail elimination.

The PSR-500 has a digital AGC that instantly compensates for low audio levels that are very common on digital systems. This makes the radio's digital communications easier to listen to in combination with the adaptive digital tracking mentioned above.

Like many of the recently released scanner models, the PSR-500 will perform a NOAA weather band search, SAME weather alert, weather priority scan, and a new SKYWARN Storm Spotter function.

There are a lot of other PSR-500 features, far too many to include in this review. You can get more information on these features by going to my personal blog page at **http://monitor-post. blogspot.com/2007/08/gre-ps-scanner-in- formationspecification.html**.

❖ Multi-System Trunk Capability

The PSR-500 is a multi-system trunking scanner. This lets the user follow unencrypted conversations on analog Motorola, Motorola mixed mode (3600 baud) systems, P25 (APCO 25 9600 baud) systems, EDACS (wide and narrow), EDACS SCAT, and LTR trunked radio systems. Trunk systems in VHF, UHF, the new 700 MHz public safety band, 800 MHz, and 900 MHz bands can be programmed. This includes trunk systems now being installed by the Department of Defense in the new 380-399.9 MHz LMR subband. The scanner can also scan both conventional and trunked systems at the same time. The PSR-500 will not decode M/A-COM proprietary modes such as Open Sky and ProVoice. Talkgroup call and individual call monitoring are supported.

I was especially impressed with the trunk system information presented on the display when the scanner was put into the tune mode and a control channel was being monitored. This is the best implementation of this feature I have seen thus far by any manufacturer.

❖ What's in the box?

In addition to the PSR-500 scanner, accessories in the box include a rubber duck antenna, owner's manual, normal battery holder, rechargeable battery holder, belt clip, and USB PC interface cable.

❖ What Else is New?

In addition to the Object Oriented programming and the LED Alert, here are three more features on the PSR-500 scanner that are new to the scanning world:

• **SKYWARN Storm Spotter Function** – Provides instant, one button access to frequencies used by storm spotter networks. You can monitor storm conditions as they occur, and may become aware of dangerous weather conditions before the media and emergency management officials are able to announce them to the general public.

• **P25 NAC Functionality** – Much like CTCSS and DCS with analog signals, a P25 Network Access Code (NAC) is used to provide selective squelch operation on conventional P25 channels. This GRE digital scanner will detect the NAC that is being used on a P25 conventional digital channel, and will allow the user to program NAC codes to block transmissions that do not have a matching NAC, including analog traffic on the same frequency. Within a second I was able to determine that the NAC used by the great Smoky Mountain National park comm system was 293.

• **Trunking Control Data Output** – This function streams decoded trunking control data from your PSR-500 to a personal computer for use with popular third party trunking control channel monitoring software. No slicer is needed. Also streams NOAA weather radio SAME alert data.

❖ Overall Rating and Final Thoughts

Those of you who read this column on a regular basis know that no scanner is perfect. I just haven't found my perfect scanner yet. I do have few complaints with the PSR-500.

In my opinion there are not enough channels per scan list (1800). If I was in a major metro area such as Atlanta and wanted to monitor several trunk systems and conventional frequencies, I would be hard pressed to decide what talkgroups, frequencies, search ranges, etc. I would program within the 1800 limit.

Another area of concern was the dynamic range of the scanner. This radio has a hot front end; in fact, maybe too hot. Our local FM radio station caused me a bit of grief in testing when I added any substantial antenna, such as a beam, etc. When I was mobile in higher RF areas I saw this symptom repeated, especially in the VHF high band area of the spectrum.

While the scanner's audio quality is very good, it falls just a notch below what my ear likes. To my ear, the audio delivered by the PSR-500 is good, but it is just a tad tinny. But audio levels are very good, with good range of control on the volume knob. However, I don't like the volume knob/squelch control. Many times, when I would readjust the squelch, the volume knob turned at the same time. I would have to turn the volume back up, then adjust the squelch control. I don't have fat fingers, so that wasn't the cause of the anomaly.

I am concerned about the keypad durability and the belt clip. I have a Pro-43 that is next to useless now, due to keypad wear. I hope this problem is not repeated in the PSR-500 scanner. And the beltclip? It isn't a matter of *if* it will break, but *when*. After seeing other units in the marketplace with beefed up beltclips, the hard plastic clip on this scanner was a disappointment. Only long term testing will determine if either these concerns will turn out to be issues.

Bottom line, though: GRE has raised the scanner market bar again. No one in the scanner marketplace right now offers a handheld scanner model that has the listening capability that is found in the PSR-500.

The GRE PSR-500 (SCN-18) is available from Grove Enterprises (1-800-438-8155 or ***www. grove-ent.com/grepsr500.html****) for $499.95 plus shipping.*

Codan-based networks, take this unidentified example from Greece where the format is "0000" + 2 digits + "00" + 2 digits. This network triggers data using the Codan 16 tone modem.

Frequencies:
4517, 5770, 6792, 6875, 7495, 7650, 8007, 9048, 9050, 9215, 9230, 11490kHz (all LSB)

Identifiers:
0000120011, 0000120013, 0000220012, 0000410012, etc

RESOURCES

Codan Audio
  www.signals.taunus.de/WAV/CODAN16. WAV
Codan Chirp
  www.signals.taunus.de/WAV/CODAN- CHIRP.WAV
Selcal Translator
  www.kloth.net/cgi-bin/selcall.pl

GROVE

Kaito's Multifaceted KA1121

A portable shortwave radio that keeps up with the times

By Ken Reitz KS4ZR

There's nothing new about a portable shortwave radio, but the Kaito KA1121 has a built-in MP3 player with 256 MB of Flash memory that you can use to download your favorite on-line podcasts and record your favorite shortwave, AM or FM programs for later listening.

❖ Kaito Pulls Out the Stops

The list of features for the KA1121 is impressive: It has long wave and medium wave coverage from 140 kHz to 1710 kHz; shortwave coverage from 3-29.999 MHz; FM from 70-108 MHz and all seven channels of the NOAA Weather band.

But wait, there's more! It comes with rechargeable batteries for both the main radio and the MP3 player and separate charge circuits for both. It also tunes Single Side Band (SSB) ham transmissions, has six equalizer audio modes, three clock alarms, a sleep timer, an external antenna connector and can store up to 400 frequency presets and 100 customized station names. All this in a package just 6.5" wide, 3.75" high, and 1.25" deep.

Of course, the big attraction of this radio is the removable MP3 player which, when outside the radio, measures just 1.5" wide, 2.25" high and .5" thick. The player has a built-in USB port, earbud jack and four micro switches on the left and right sides of the unit which disappear when it's installed in the radio. These switches control the MP3 player functions when out of the radio.

Kaito's KA1121 pops its secret MP3 player. Plug in the ear buds or plug it into your car stereo; record off-air, on-line or rip CDs from your own library. (Courtesy: Kaito U.S.A.)

The display panel, which can be turned off when in radio mode to conserve battery power, serves as both the MP3 display and the radio display. A second tiny LCD display at the top of the touch pad shows the time, frequency and level of both radio and MP3 batteries. There's a 35" telescoping whip antenna, fold-out desk stand and little rubber feet on the bottom. Finally, there's a line input jack which allows you to play any other electronic output such as the audio from your computer.

❖ The KA1121 Highlights

The KA1121 is an amazingly ambitious radio. It wants to be your AM/FM radio, your MP3 player, your shortwave radio, your weather radio, and your personal recording device. Can it really do all this? As with any product this ambitious, the reviews are going to be mixed. The built-in MP3 player is clearly the big calling card here, so I'll look at it first.

Anyone born after the year 2000 already knows how to use an MP3 player, but to some of us older folks it's new technology. With a little help from the instruction manual and the included MP3 driver mini-CD, I was ripping CDs to my audio library and putting them on the MP3 player in no time. Setting up to record from the radio to the MP3 player is not easy the first time, but like anything else, the more you do it the easier it is. Of course, the audio quality will only be as good as your reception quality. On FM the quality was very good. Playback of CDs from the CD library is excellent, especially when heard on the stereo earbuds which come with the radio.

On its own, the MP3 player has its pluses and minuses. On the plus side, it's versatile. You can pop it out and slip it into your shirt pocket or hook it into your car stereo through the use of an optional FM modulator or cassette adaptor. The built-in battery charger is a real plus. The downside is that the recording space is relatively small compared to the iconic iPod®. At 256 MB, depending on the audio quality you select, you can only get a fraction of the songs you'd expect to get on a 2 GB iPod. (It also doesn't have video display, which is one of the reasons iPods need to have so much memory.) Still, you should be able to get at least 100 songs on this little MP3 player. The MP3 player has other features including display of song lyrics for music playing on the player, record from other audio sources (via the line input), and even record live with the built-in microphone.

The KA1121 comes with three AA rechargeable NiMH batteries which, according to the Kaito tech folks, should be able to go through several hundred recharging cycles. This is a huge savings in battery costs. If all portables had this feature, it would also have a great impact on landfill pollution. The charger circuit automatically shuts down after 12 hours.

I was disappointed in long wave reception with this radio, but most portables are not capable of doing justice to that band. I was able to tune in a few low band beacons within two hundred miles of my location, but little else.

AM reception on the KA1121 was a pleasant surprise. It tunes this band in 1 kHz increments, a plus for AM DXers. Sitting on the desk with the computer shut off, running on its built-in batteries and my trusty Radio Shack tunable AM loop antenna by its side, I logged quite a few stations from all directions with strong signals. From my location in central Virginia I heard CHML 900, Ontario; Radio Progresso 890, Cuba; WWL 870, New Orleans; WWJ 950, Detroit, and all the regular metro powerhouse stations. Nothing was heard west of the Mississippi – not unexpected for those of us at the edge of the east coast.

The WX band on this radio was very good. It had no difficulty tuning our local NOAA WX station over 30 miles away. It doesn't have a WX Alert mode and no provision for SAME encoding. But, it does what it's supposed to

Kaito's ambitious KA1121: AM/FM/LW/SW/SSB/WX band receiver with built-in MP3 player. (Courtesy: Kaito U.S.A.)

do: it lets you listen to weather forecasts and current conditions choosing from the seven available NOAA frequencies.

The audio from the little 2" speaker was well balanced, but could be made to distort at the highest volume setting, though there's no reason you should have the audio that high. Audio from the MP3 player was good through the speaker and very good through the ear buds. But, heard through a set of Bose headphones, the audio was even better with plenty of bass, highs and channel separation.

❖ KA1121 Shortfalls

Despite the positive features of the KA1121, it's not perfect. The first review unit I received had a problem with the small MP3 battery charging circuit. But, Kaito customer service proved knowledgeable, and a replacement, which worked perfectly, was quickly sent. The small size of the radio and MP3 player requires some finger dexterity. For example, the fine tuning wheel is so close to the headphone jack that, if you're listening with headphones, it's tough to tune the SSB feature. The display will challenge those who don't think they need reading glasses. The tuning gap between 1,710 and 3,000 kHz is significant for shortwave enthusiasts. The digital entry tuning method is awkward.

The radio is sensitive to ambient electronic noise. In fact, the manual says to listen to AM or SW stations using the batteries, because the AC adaptor may cause noise and interfere with reception. Reception on those bands did improve when the radio was running on battery power. But, I found that even on battery power the radio was sensitive to noise generated by nearby computers – a four year old desk model and a two year old laptop.

This was only a problem when I was trying to copy digital modes such as RTTY and SSTV. The strongest of those signals could override the interference from the computers but weak signals could not. Away from the computer the digital signals were strong and would have been easily copyable. This was not a problem on the KA1103 at my location.

❖ Last Word

This is a hybrid period across the entire radio industry. We're on the bridge between the analog past and the digital future. Accordingly, we may be seeing the first of a new wave of hybrid shortwave radios in the KA1121. While Sony and Sangean haven't shown us anything new in the way of design for years, Kaito is at least moving in the right direction, taking advantage of current digital technology and applying it to the ordinary portable shortwave radio. The two most important features of this radio are the built-in MP3 player and the battery charging circuit. They should be standards in all portables.

The KA1121 is a complicated radio. If you have trouble programming your scanner, VCR, or digital clock, this radio is not for you. If you're a tech savvy radio enthusiast who doesn't mind spending some time with a poorly written manual, take a chance on this radio. The KA1121 retails at $250, but I found it available at Universal Radio for $149.95 plus shipping.

BRAC Closures / New Airports
By Iden Rogers

The Base Realignment and Closure Commission (BRAC) was enacted some years ago to periodically select U.S. military bases that could be closed or realigned for different uses. The intended purpose has been to cut billions of dollars from the defense budget. For BRAC info: **www.govexec.com/specialreports/brac.htm** and **www.defenselink.mil/brac/** .

The BRAC Commission met in 1995 and again in 2005. The BRAC 2005 Commission turned over the list of bases recommended for closure or realignment on May 13, 2005.

Twenty-five major installations are to be closed down and 24 others radically realigned over the six years following the report. Your local newspaper should alert you to any affected bases in your area.

A few bases have and will become civilian airports. This changes the communications that we hear. Ones that don't become airports can have all kinds of different businesses and government entities, many of which may provide new and interesting, non-aircraft listening. BRAC closures do not happen overnight. Over the next few years, keep an eye and an ear out for the changes as they progress.

Here are three of the previously closed bases that now have civilian air activities:

GEORGE AFB in the California desert near Victorville, closed in 1992, has become a cargo airport named Southern California Logistics Airport.

VICTORVILLE TOWER 118.35, VICTORVILLE GROUND 124.45, JOSHUA APPROACH and DEPARTURE 124.55, WX AWOS 109.40. For more airport info, see: **www.airnav.com/airport/KVCV** .

MATHER AFB in Sacramento California, closed in 1993, has become Sacramento Mather Airport and also serves as an air cargo airport with plans to become a major hub.

MATHER TOWER 120.65, MATHER GROUND and CLEARANCE DELIVERY: 121.85, NORCAL APPROACH 119.1, NORCAL DEPARTURE 127.4, CLEARANCE DELIVERY 121.85, UNICOM 123.075, ATIS 118.325. For more, see: **www.airnav.com/airport/KMHR**

BERGSTROM AFB next to Austin, Texas, has become the Austin-Bergstrom International Airport with reports that it "is the biggest new airport project in the United States since Denver International."

AUSTIN TOWER 118.225, 121.0, AUSTIN GROUND 121.9 121.7, CLEARANCE DELIVERY 125.5, AUSTIN APPROACH and DEPARTURE 118.8 119.0, UNICOM 122.95, ATIS 124.4, WX ASOS 127.875. See: **www.airnav.com/airport/KAUS**

It will be interesting to see what additional new airports BRAC 2005 will bring.

Full Spectrum Logging and More Enigma

It seems that in our current world everything is changing at a rapid rate. As a student of history (among other interests), I've noted that past civilizations experienced a similar explosion of activities as they developed.

The difference is that with instant global communications and the Internet our, "explosion" is in raw information. This is very unique to our times. I read (but have not yet confirmed) that at the rate new information is being generated, we are doubling our amount of information every three years! Boy, are we getting smarter! Right? More on this subject later.

Trying to keep up with the latest information is tough. We'll do our part this month by looking at a new version of a popular logging program by Dxtreme Software that we last reviewed years ago. Then we'll take a quick look at what the Enigma machine expert, Dr. Tom Perera, W1TP has recently released. Let's get started.

❖ Logging At Its Best

A few years ago, we found Dxtreme Software's Reception Log. Back then it in came in two different versions, one for Hams and another for SWLers. The new version, 5.0.1, is billed as "**Full-Spectrum Logging …** radio stations, television stations, broadcast stations, utility stations … from long wave, to medium wave, to short wave and beyond!"

Marketing hype? We'll soon know the answer.

We installed Reception Log from the CD onto our 1.6 GHz Duo Core T2060 CPU, 1.4GB of RAM, using a Vista Home Basic operating system. If you also use Vista, make sure that ActiveX is installed and running.

The more I use Vista, the less impressed I am with it as an operating system. UAC stands for User Access Control, a "new" innovation in Vista that is suppose to give a higher level of security to your computer. Unfortunately, in my experience, it also gives a higher level of frustration to authorized users by stopping them from running their programs. In order to minimize problems, I suggest that you install Reception Log as a Vista "Administrator" and run it under this account.

UAC... Ah yes, Microsoft acronyms and marketing hype instead of good solid programming code. More "accommodations" to operation under Vista are detailed on Dxtreme Software's website.

With that said and done, Reception Log installed quickly and easily from its CD.

When you run Reception Log for the first time, you'll be presented with a big screen with lots of empty boxes, see Figure 1. Just think of

Figure 2 - Personalizing the "rigs" drop-down choices to your radio needs.

it as your blank customizable log. The six tabs running horizontally near the top, just below the two Command bars, offer higher levels of detail for each logging.

We are currently displaying the "Reception Log" in Figure 1. This is the initial and most basic logging screen. Here elementary station details such as location, frequency, and modulation type are entered. Notice that the screen contains lots of drop-down fixed-choice selection menus. The down-pointing arrowheads positioned to the right of the boxes indicate this feature. "Rig," at the lower left, is one of them. This data approach makes for easy and consistent entries.

❖ Customizing

I have usually found the menu method limiting, however, since the fixed entry choices must exactly match your application needs. For folks like me, Reception Log has found a very easy, yet elegant method of making dropdown entry choices user customizable. Click on "Modules" in the Command bar at the top of the screen and then choose "Rigs." You will see an almost blank list where you can easily add your radios as I have done in Figure 2. Here I've added a few of my radios using the "Add" button at the top right and then filling in my details.

Using the "Modules" command, all dropdown menus such as antenna, mode, etc., can be personalized to your exact words and radio monitoring or Ham tastes. Now, when you select one of these menus you will be able to select an entry from your customized choices as seen in Figure 3.

Figure 3 is a logging of a VHF NOAA weather station. Not very exciting, but it clearly shows the versatility of this logging program. Notice that the open menu choices for "Rig," seen at the lower left, are the ones we entered in Figure 2. Also notice that in "Station Class" we have selected weather, WX, a class which I added.
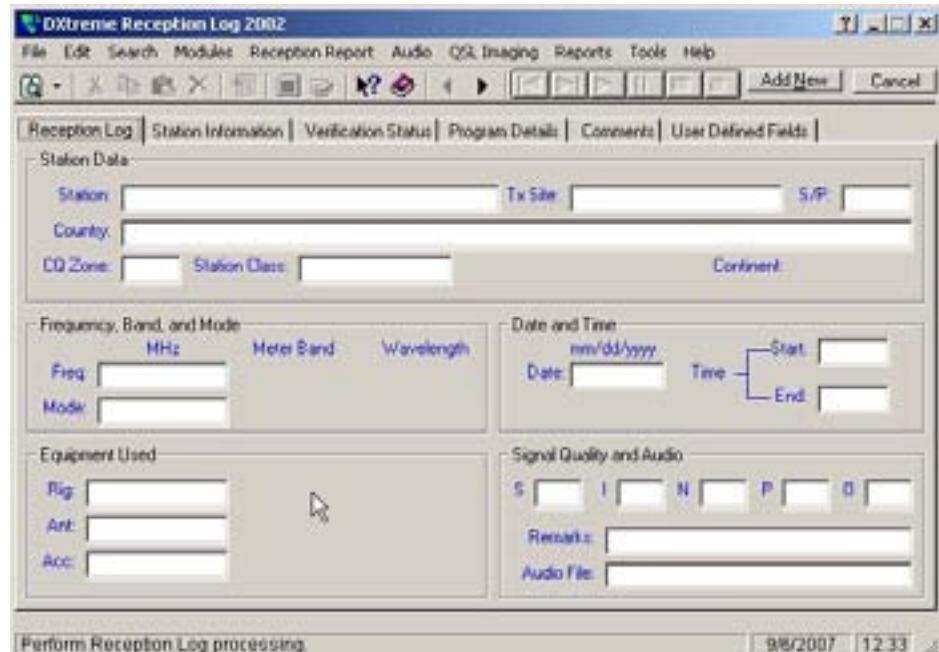
Figure 1- A clean (empty) reception log's main screen. Now make IT your own.
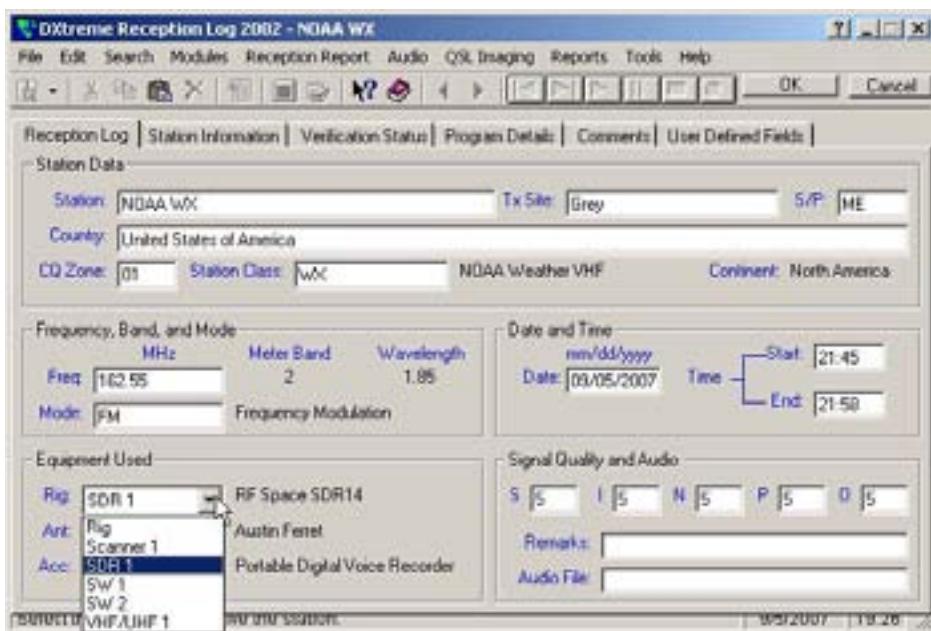
Figure 3 - A Fully "Inputted" and customized reception log screen. Notice info defined in Figure 2 is displayed as rig choices (lower left).

There are thirteen menus that can be customized to the user's radio habit(s). Some information fields are geared toward Ham loggings such as CQ Zone, but the majority of data fields are useful to all radio logging needs. This is a powerful feature of Reception Log that might just make it a "full spectrum" logging tool.

Each time the program is started, the user is given the opportunity to customize the program via the "Preferences" menu, which can be found under the "Tools" command. Here we can customize many of Reception Log's data fields.

For example, we can add our user information, such as our mailing address, email address, and other personal data for use in reports. From this screen we can also set database rules such as "permit duplicate entries."

❖ Tabbing Deeper

So far we have just explored the Reception Log tab, one of six screens of information that are capable of holding station details for *each* logging. The "Station Information" tab, as you'd expect, holds the station's physical and web address.

The "Verification Status" screen is the repository of QSL information, such as sent and received status. A unique feature is the capability of scanning a QSL card image into the

Figure 4 - The "user defined fields" screen. Having a whole screen "your way."

screen. This is performed via the "Preferences" menu. Then when the same station is logged at a later date the image of the stations QSL card (front and back) will be displayed along with logging history of the station.

❖ Not Enough Yet?

If you need/want more custom fields, look to the "User Defined Fields" tab. Again, using the "Preference" menu, all seven fields on this screen can be customized, as seen in Figure 4. The first four fields I've defined for use for my various types of monitoring. The user can type anything into the boxes.

The lower three boxes are a bit different. They are filled in using dropdown menus. Both the titles and the menu choices are again, completely user definable.

❖ Never Satisfied

As it stands Reception Log is an outstanding logging program, one of the best I've used. But what additional feature would make this program indispensable to the entire radio community? Radio control. Of course, to keep its full spectrum status, the radio control functions would have to be compatible with many transceiver/receiver types. Well, one can dream.

The famous marketing cry of the 20th century proclaimed: "Now, with Reception Log, you really can have a logging program that is tailored to your exact radio needs, be it Ham, SWLer, Scanner Enthusiast, Utility Junkie or Signal Hunter!"

Although the new version 5.0.1, is aimed at Hams, with its many user customizable and user defined data fields it does a great job for ALL radio monitors. Yes, this is a true "full spectrum" logging program.

Reception Log by Dxtreme Software can be ordered at **www.dxtreme.com**/ for $49.95 (or print out the order form and send check or money order to DXtreme Software, 26 Lang-

holm Drive, Nashua, NH 03062). Add $3 for users outside of North America. Tell them you saw it in *Computers & Radio*!

❖ Talking Updates

One of the most popular articles I wrote a few years ago was on the famous Enigma crypto machine. Much of the material came from the world expert on the Enigma machine, and owner of many different types, Dr. Tom Perera, W1TP. His site at **http://w1tp.com/enigma** is a wealth of Enigma pictures, information and history.

Tom has just released the 4th edition of "The Story of the Enigma: History, Technology and Deciphering" on CD. This collection covers every possible aspect of this fascinating "black" communication technology. It includes complete books and manuals on Enigma, videos, close to 2000 photos, detailed exploded view diagrams, model/user databases, PC/MAC Enigma simulator programs, overviews of WWII German radio equipment and systems, Russian FIALKA machines and a lot more. This new edition is greatly expanded over the last edition. At $15 plus $3 shipping, if you are interested in the Enigma machine and code breaking, this CD is a **must** and a real bargain.

Interested in World War II military radio hardware? Then check out Tom's "Foreign Military Radios" CD. It contains literally thousands of pages on Japanese, German, and Italian communication systems including detailed descriptions, pictures, diagrams and more. One of Tom's other passions, telegraph keys, is included on the CD. The pricing is the same as the other CD. See his website (above) or at **www.artifaxbooks.com** (151 Barton Road, Stow MA 01775) for ordering.

❖ Final "Explosive" Thoughts

Although we, as a civilization, may be generating tremendous amounts of information, don't mistake this for knowledge. The *amount* of information generated is not as important as the *quality* of the information.

You may have noted that the quality of the information you receive from all sources is becoming less reliable and less credible. Credible: Now *there* is a word that has gone out of fashion.

Consider carefully the difference between information and knowledge. Only when *valid* information is *learned and applied* does it benefit a person or a civilization as knowledge. Until then, it is a collection of random, sometimes incorrect, facts, which tend to confuse and mislead people.

I recently did a year's stint as a Chemistry teacher and observed first-hand the thought processes of students, faculty, and administration. That was an eye opener! The Dutch saying, "A fish stinks from its head" may be an appropriate summary.

As a civilization, we may be experiencing an information explosion. But at the same time we are experiencing a knowledge *implosion*: Exposed to more information, much of it erroneous; learning fewer (if any) subjects in depth. Welcome to the beginning of the 21st century.

Till next time … be selective and question everything.
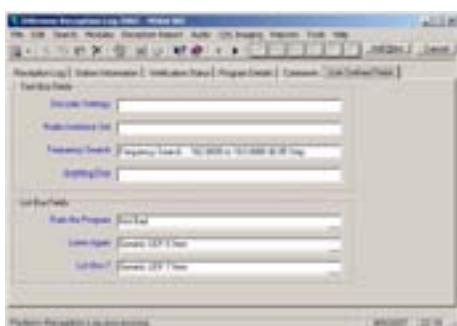
What's NEW

GRE Picks a Winner

How long has it been since you've seen any innovations in an entry-level scanner? GRE's line-up of scanners to be offered under its own name includes a $99.95 scanner with several features that make it highly desirable (as well as affordable) for rural and small-town hobbyists – especially for those living in areas prone to severe weather. The PSR-100 (handheld) and PSR-200 (base/mobile) scanners are analog, double-conversion receivers with no trunking capability. Frequency coverage includes the standard bands from 29.000 to 512.0000 MHz with no 700/800 MHz coverage.

What these scanners do well is to automatically tune to the National Weather Service when an emergency is announced for your area (user-entered FIPS code); one-button tuning can take you to the frequency used by your local Skywarn net for on-the-ground reports.

The PSR-100/200 scanners include five pre-programmed bands: Marine, Fire Department/Police Department, Air (Civilian), Amateur Radio, Weather. 200 memory channels are held in 10 banks. The Spectrum Sweeper function (available on the '100 but not the '200 model) acts as a near field receiver (also known as "Signal Stalker" and "Close Call" by other manufacturers).

The PSR-100 operates on four AA cells. Accessories include: Rubber duck antenna, belt clip, owners manual, normal battery holder, and rechargable battery holder. The new GRE scanners are available from Grove Enterprises (**www.grove-ent.com** or call 800-438-8155) and other *MT* advertisers.

The NRC AM Radio Log, 28th Edition

This weekend we had our first real cool morning here in Brasstown and college football has returned to my TV set. That, my friends, is a sure sign that fall is rapidly approaching. And I know after long experience as a radio hobbyist that the fall season heralds the start of a new medium wave band DX season. It also means that one of my favorite annual radio publications is again available for purchase – The *NRC AM Radio Log*.

Formerly known as the *National Radio Club Domestic Log*, the first edition of this annual favorite was published by mimeograph and the stencils were hand-typed in Boston by the legendary AM radio hobbyist John Callarman. Since that first edition (which I still have, by the way), the *Log* has gone from its early crude roots to today's sleek professional publication produced by Wayne and Joan Heinen.

This 2007-2008 28th annual edition of the National Radio Club's AM Radio Log contains 281 pages in 8-1/2 by 11-inch size, 3-hole punched, loose leaf format, so you can put it neatly into a 1-inch three ring notebook.

AM band radio station by-frequency listings from the United States and Canada include the expanded (X-band) stations from 1610-1700 kHz. Each station listing consists of its operating frequency, callsign, location (city and state of license), time zone, antenna, and transmission power, mailing address and daytime telephone number, hours of operation, broadcast format/networks, and much more.

There are also cross reference listings by city and callsign, as well as a list of stations conducting AM stereo operations.

Recent additions to the log are call letters of FM simulcasts, listings of regional groups of stations (the groups section is a separate segment of the log book), and a cross reference of those stations that are licensed to use IBOC (In Band On Channel) digital audio.

There are nearly 7,000 updates new to this edition since the 27th edition was released in the Fall of 2007.

The *NRC AM Radio Log* is available from several radio dealers and directly from the club website at **www.nrcdxas.org/**. The *Log* lists for $25.95 (non-NRC members) and $19.95 (for members). New York residents will have to add 8% sales tax. Be sure to check the website for current pricing including Canadian and overseas rates on this publication.

You can also get additional information or send orders via mail to: National Radio Club Publications, Box 164, Dept W, Mannsville, NY 13661-0164.

The *AM Radio Log* is the most accurate source on AM radio stations in the United States and Canada. If you tune the AM broadcast band, you need the *AM Radio Log*. Quite frankly, no self respecting AM DXer or listener should be without this superb publication on their radio room bookshelf.

– Reviewed by Larry Van Horn

Get Ready for 2008

Once again, Scott Fybush's **Tower Site Calendar** is ready to grace the walls of your office, rack room or shack. **Tower Site Calendar 2008** features 14 full-color, high-quality images of transmitter sites from coast (WGAN Portland) to coast (KAST Astoria, the cover model). It also includes an action shot: the demolition of the WOR towers in New Jersey last January.
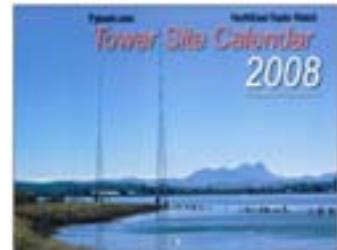
The calendar is shipped via first-class mail, shrink-wrapped for protection. Scott says, "Our previous two calendars have sold out, and we expect this year's edition to sell out, too." Scott promised to hold the price at $17 only until October 1st, so you'll need to check **www.fybush.com/calendar.html** to confirm current price and shipping outside the U.S., or email *calendar@fybush.com*. You may order by credit card on line, or mail a check payable to Scott Fybush at 92 Bonnie Brae Avenue, Rochester NY 14618. (No orders by phone; NY residents include 8% sales tax.)

Are You Legal?

Order the *FCC Rules and Regulations for the Amateur Radio Service* – complete Part 97 rules from Title 47 of the Code of Federal Regulations – from the American Radio Relay League, 225 Main Street, Newington, CT 06111 (888-277-5289). This edition includes the newest regulations effective February 23, 2007. Cost is $5.95 plus $6 shipping.

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PSR-400

PSR-200

PSR-100 *Handheld Scanner*

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- Backlit LCD Display
- PC Programmable, and MORE!

>> *Please visit www.greamerica.com for more detailed information*

Stock Exchange

Attention all those wanting to know what's going on with ham radio in the New Orleans area, check out: http://groups.yahoo.com/group/GNOAmateurRadio/

WANTED: E.F. JOHNSON C.B. MATCHBOX #250-49, RICHARD: WA0KKC - 913-432-5136

WANTED: A mobile doppler direction finding system similar to the design shown in QST Magazine May & June 1999. ballardn5WV@aol.com

For Sale: Sony ICF77 and ICF2010 in mint condition. Asking $500 each. Call Ben, 732-238-3438 or cell 646-662-8635.

Blogs offer an opportunity for columnists to share information that does not make their columns. The news might be too timely for deadline, too short, confined to a small geographical area, too far away to be heard in North America, or even off the columnist's regular "beat." Bookmark these blogs for frequent visits!

MT: AMERICAN BANDSCAN
http://americanbandscan.blogspot.com/ - by Doug Smith
MT: EDITOR'S DESK
http://mt-editor.blogspot.com/ - by Rachel Baughn
MT: FED FILES
http://mt-fedfiles.blogspot.com/ - by Chris Parris
MT: MILCOM
http://mt-milcom.blogspot.com/ - by Larry Van Horn
Larry's Monitoring Post
http://monitor-post.blogspot.com/ - by Larry Van Horn
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WHO SAYS THE WORLD IS ROUND?

✽
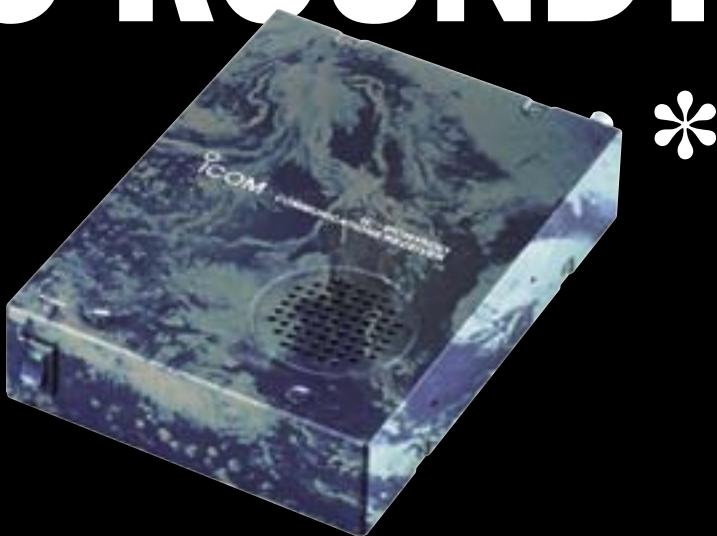
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✽ Neat, look huh? It's just advertising. The radio is actually black. Very attractive, yes. But black. If we had put a black radio on this ad, the headline would not have been as quick to read. So we made up this look. Black is nice. Think of it as seeing the world from the night side. It's still there. You just can't see it. Can't get over it? If you send us $5000.00 USD, we'll make up the radio look just like this for you. Is it worth it? Not to most people. But you're not most people. Are you? E-mail icom@icomamerica.com with "worldPCR" in the subject line for more info. ** Cellular frequencies blocked.

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